

IN THE CASE OF
UNITED STATES OF AMERICA
V.
GREG ABBOTT, GOVERNOR OF THE STATE OF TEXAS,
AND THE STATE OF TEXAS

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
AUSTIN DIVISION

CASE No. 1:23-CV-00853-DAE

EXPERT OPINION REPORT
PREPARED BY:

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June 14, 2024

1. Summary of Background and Qualifications

Dr. Eleftherios “Lefteris” Iakovou is the Harvey Hubbell Professor of Industrial Distribution at Texas A&M University and the Associate Director for Resilience and Sustainability of Integrated Energy and Manufacturing Supply Chains in the Texas A&M Energy Institute.

He further serves as: (i) the Director of Manufacturing and Logistics Innovation Initiatives at the Texas A&M Engineering Experiment Station (TEES); (ii) the Director of Supply Chain Management for the SecureAmerica Institute, a national consortium of industry and academia focusing on Resilient and Secure Manufacturing Supply Chains for the U.S. Industrial Base; (iii) the Co-Director of the Global Value Chains Program at the Mosbacher Institute of Trade, Economics and Public Policy at the Bush School of Government and Public Service of Texas A&M; and (iv) the Associate Director for Supply Chain Management and Applied Operations Research at the Texas A&M Center of Applied Technology. He also served as the Supply Chain Lead for the Texas A&M Emergency Management Advisory Group that was formed at the onset of the pandemic.

He further holds courtesy appointments as a Professor of Supply Chain Management at the Mosbacher Institute of Trade, Economics and Public Policy at the Bush School of Government and Public Service, and at the Department of Multidisciplinary Engineering at Texas A&M.

Dr. Iakovou’s research areas include supply chain management, supply chain strategy and policymaking, applied operations research, manufacturing & production systems, port management, intermodal & maritime logistics, resilient and sustainable supply chains, global logistics and free trade facilitation, and humanitarian & emergency response management logistics. He has published more than 250 papers in peer reviewed journals and conference proceedings,

three (3) books and three (3) textbooks. Professor Iakovou's research is highly interdisciplinary and is very well received with over 6,380 citations and with an h-index of 34 ([his google citation index](#)). He has supervised more than 30 Ph.D. students and 20 Post-Docs. He is the Associate Editor for the Americas for the Maritime Economics & Logistics journal, and an Editorial Board Member for the International Journal of Logistics Economics and Globalization, and an Advisory Council member of the Harvard Business Review.

His latest book (which he co-authored) titled: "*Breakthrough Supply Chains: How Nations and Companies Thrive and Prosper in an Uncertain World*", McGraw Hill Professional, ([Breakthrough Supply Chains](#)), has received 17 endorsements from leaders from Stanford, MIT, Georgia Tech, Walmart, The Financial Times, Johnson Controls etc., as groundbreaking in the field for next-generation supply chains geared towards policymakers, company executives and academics. Additionally, the book has been endorsed by the Council of Supply Chain Management Professionals (CSCMP) and was recommended to its 10,000 members. It has further been accepted into the Pentagon Library, which serves the information needs of offices of the Secretary of Defense, Joint Chiefs of Staff, and Military Departments located at the Pentagon. As of January 2024, the book is on the New Arrival list and will later be moved to the Suggested Readers List. Dr. Iakovou has entrepreneurially developed winning teams, public private partnerships, supply chain and logistics centers of excellence, interdisciplinary initiatives and consortia with corporations and governmental agencies alike, in the U.S. and throughout the European Union (EU).

He has served as the principal investigator (PI) or Co-PI for more than 60 interdisciplinary research grants from federal, private, and industrial funding agencies. During his nine years at Texas A&M, he has been awarded as a PI or Co-PI large-scale projects for total funding of more than \$13M.

Dr. Iakovou has further consulted for a number of governmental and corporate organizations both in the U.S. and the EU (including the European Commission), for more than three decades. He has contributed to 100+ events as a keynote and/or invited speaker, and has organized and/or chaired 45 workshops, and national and international conferences, often involving heads of state, ministers, ambassadors, and other dignitaries.

His scholarly work on next-generation cost-competitively resilient supply chains has attracted wide interest and was cited in the 2024 Economic Report of the President of the United States.

He has been interviewed and/or served as a technical expert for the U.S. Department of Defense (DOD), the U.S.-China Economic and Security Review Commission of the U.S. Congress, the United Nations Office for Disaster Risk Reduction (UNDRR), and as an Advisory Board member for the PLANET large-scale intermodal logistics consortium of the European Union. He also served as reviewer panelist for the large-scale National Science Foundation (NSF) Engines Type-2 program.

In the 2020-2024 period he has presented as keynote speaker for events of the Oak Ridge Associated Universities (ORAU), the American Institute of Chemical Engineers (AIChE), the Gartner Research Board, The University of California San Diego, the Bush School of Government and Public Policy, the Texas A&M Energy Institute and Dow Chemicals.

Dr. Iakovou holds a 5-year Diploma in Mechanical Engineering from the Aristotle University, Greece. He received his M.Sc. in 1990 and his Ph.D. from Cornell University, Ithaca, NY, in 1992 in Operations Research and Industrial Engineering. He then served first as an Assistant Professor and then as a Tenured Associate Professor at the Department of Industrial Engineering of the University of Miami, Coral Gables, FL. Prior to joining Texas A&M, he served for eight years as the Chair of the Department of Industrial Management and then as the Chair of the School of Mechanical Engineering, at the Aristotle University of Thessaloniki, Greece. He guided the School in attaining the #1 ranking in Greece. He also served as the President of the Board of Directors and later also as the CEO of the Alexandrian Innovation Zone S.A. overseeing the innovation ecosystem of Northern Greece. Under these capacities he drafted legislation and presented to the Parliament of Greece.

Dr. Iakovou's track record is based on the triple helix of: (i) a nationally recognized supply chain management academic scholar and leader; (ii) a successful fundraiser; and (ii) a strategic thinker with transformational impacts on the organizations that he has served.

Dr. Iakovou has more than 90 publications over the last 10 years, as described in the attached curriculum vitae (C.V.).

2. Summary of Expert Opinions

In my expert opinion the Rio Grande River: (i) currently is not commercially navigable; and (ii) there are not any technically and economically feasible improvement alternatives to achieve the commercial operation on the Rio Grande that could establish it as a viable Inland Waterway Transportation (IWT) corridor of the Highway of Commerce.

3. Background on Highway of Commerce, Global Supply Chains, Intermodal & Maritime Logistics and Inland Waterway Transportation

In this report I provide my expert opinion about the potential of commercial navigation across the Rio Grande River. “Rio Grande River” in this report means Mile Markers 275.5 to 610.

Herein, I first provide the wider up-to-date contextual framework for how the *Highway of Commerce* and the next-generation global supply chains are morphing under the new geopolitical, technological and business landscape. I then proceed by discussing the role of intermodal logistics networks and then its subset, inland water transportation which is at the core of this litigation. I continue by discussing the threat of illicit trade contaminating commercial supply chains throughout the U.S. Southwest Border. I then zoom in on the Mexico-US trade, and the latest trends regarding the Port of Eagle Pass and the Port of Laredo. I also discuss the significant potential of Texas ports towards strengthening the U.S. national supply chain resilience. Throughout these sections I point out my relevant expert opinion regarding the Rio Grande River as per the theme of each section.

All these are essential inputs in my expert opinion regarding the potential for commercialization of the Rio Grande River which is provided in the final section. I conclude by listing my publications over the last 10 years, additional documents that I relied upon, my compensation and my C.V.

What is the Highway of Commerce?

Highway of commerce generally refers to “a corridor or conduit within which the exchange of goods, commodities or property or the transportation of persons may be conducted” HIGHWAY OF COMMERCE, LawInsider.com (visited June 10, 2024); *see also* HIGHWAY,

Black's Law Dictionary (11th ed. 2019) (“Broadly, any main route on land, on water, or in the air.”); COMMERCE, Black's Law Dictionary (11th ed. 2019) (“The exchange of goods and services, esp. on a large scale involving transportation between cities, states, and countries.”); *see also* Archer B. Hulbert, *The Paths of Inland Commerce-A Chronicle of Trail, Road, and Waterway*, Yale University Press (1920).

The term has been used mainly in the past to capture the networks of various modes of transport used to facilitate trade. The U.S. State Department, when directing consular offices to provide information for *Highways of Commerce*, instructed that “[n]o traffic line need be mentioned unless it carries passengers, through mails, or freight *in very considerable quantities*, the purpose of these reports [on Highways of Commerce] being to supply to American merchants, travelers, and students authentic information concerning the great highways of traffic and travel.” Bureau of Foreign Commerce, *Highways of commerce: The ocean lines, railways, canals, and other trade routes of foreign countries*, Washington: Govt. Print. Off. p. 15 (1899) (emphasis added), available at <https://catalog.hathitrust.org/Record/001348258>. Notably, *Highways of Commerce* concludes, in relation to the Rio Grande River, that “[i]t is navigable for a short distance from Matamoras to the interior for good-sized boats, and small craft ascend as far as 196 miles from this point.” *Id.* page 58.¹

¹ The Brownsville-Matamoros International Bridge is Mile Marker 56.36, and 196 miles inland on the Rio Grande River is roughly Los Saenz, Texas, Mile Marker 253.22. *See* Adrian Cortez’s Expert Report, Table of River Miles. This case involves Miles Markers 275.5 to 610, beginning approximately 25 miles upstream of Los Saenz, Texas.

A federally financed 2010 report (by the U.S. Department of Transportation, the Federal Highway Administration, and the Florida Department of Transportation) on Highways of Commerce² defines the term thusly (emphasis added):

“Highways of Commerce” ... is a term that describes major freight corridors connecting the nation and even the world *Highways of commerce move significant volumes of freight and freight that has a high value to end users.* Importantly, although the majority of these freight corridors are on the regional highway network, highways of commerce can also include major waterways, rail lines, and air links to origins or destinations outside of the region. In addition to the main corridors, highways of commerce can also include connectors that move significant volumes of freight to and from a major economic activity center such as a port, intermodal facility, or industrial and distribution complexes.”

The *Highway of Commerce* in the modern era, and especially during the last four decades, has been developed and maintained to serve primarily globalized supply chains, with recently, an increasing focus on national and regionalized supply chains embedded within them.

What is a supply chain?

In its simplest (for pedagogical simplicity) form, a supply chain consists of a seller and a buyer³. Considering today’s realities of industry and economics, the supply chain typically consists of suppliers of raw materials (upstream), who sell to suppliers of semi-finished products, who sell to manufacturers of finished products who, in turn (after several layers or “tiers”), sell to retailers (downstream). The retailers then stock inventory for customers to order online or physically buy in brick and mortar assets.

An indicative example is provided regarding the supply chain of a ski parka. *See* Figure 1. This product must be shipped (using various modes of transport), warehoused and inventory

² Regional Freight Network Plan: Highways of Commerce, Final Report, Prepared by DRMP, April 2010.

³ Gopal C., Tyndall, G., Partsch W., Iakovou E., “*Breakthrough Supply Chains: How Companies and Nations Can Thrive and Prosper in an Uncertain World*”, McGraw Hill Professional, 2023, <https://www.breakthroughsupplychains.org/>.

stocked for the supply chain to work in fulfilling customer demands while assuring supply. This includes online ordering, direct to customer delivery, retail store shopping and a host of variations in order and delivery. The supply chain is about matching and reconciling demand and supply. Finally, it must be financed, from the time that cash is paid to a supplier to the time it's received from the customer.

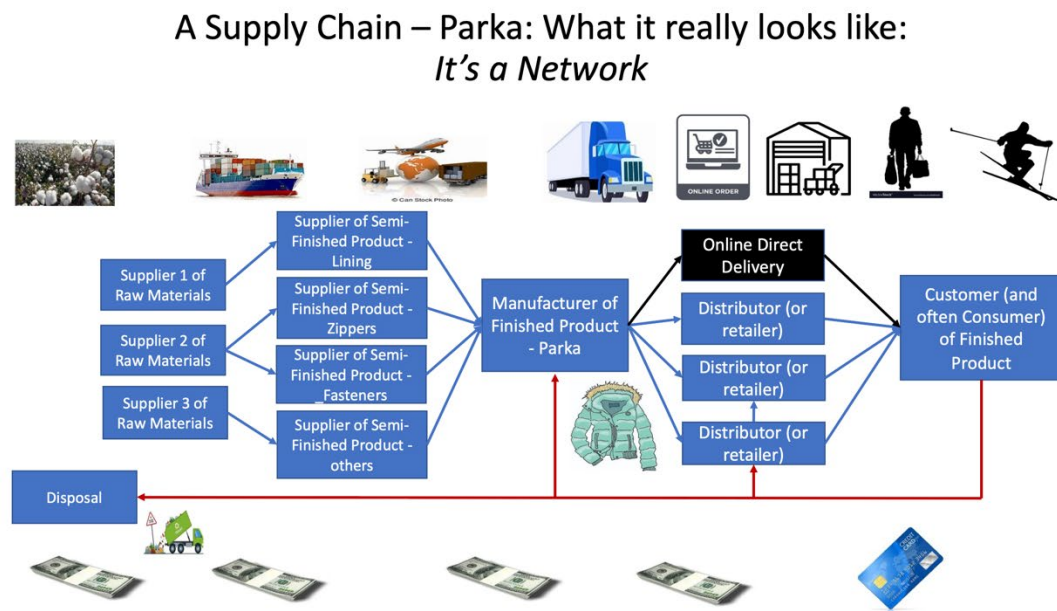


Figure 1. Source: *Breakthrough Supply Chains*, 2023; Gopal, C., Tyndall, G., Partsch, W., Iakovou, E.

Supply chains are not simple linear chains. As a result of globalization, they are very complex (often byzantine, with worrisome, limited visibility) networks of various stakeholders (such as suppliers spread around the world, manufacturers, intermodal transport operators, third party logistics operators/3PLs, freight forwarders, distributors, retailers) aiming to deliver the right product at the right price at the right quality to the final customer (industrial customer or consumer alike) at the right time. *See Figure 2.*

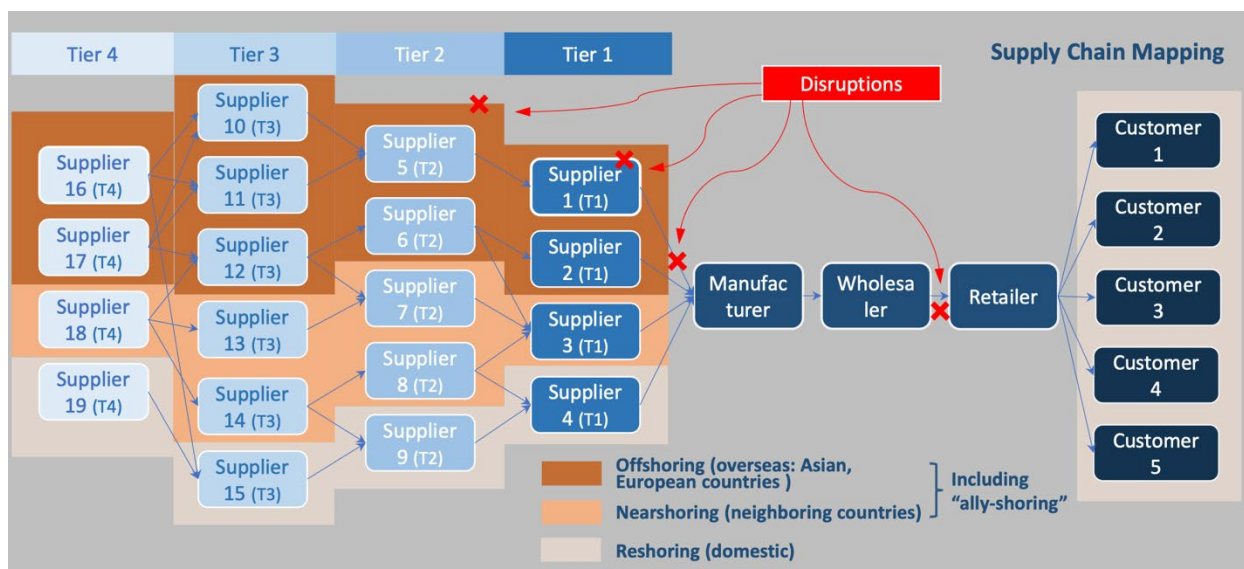


Figure 2. A Multi-Tier Complex Global End-to-End Supply Chain with reshored, nearshored and “ally-shored” sourcing. Source: Iakovou, E.

These sophisticated networks (from upstream suppliers to downstream customers) have to be orchestrated carefully in order to allow for the seamless execution of seven (7) *mega processes* across the supply chain: *plan, buy, make, move, distribute, sell* and increasingly, *reuse/recycle*. See Figure 3.

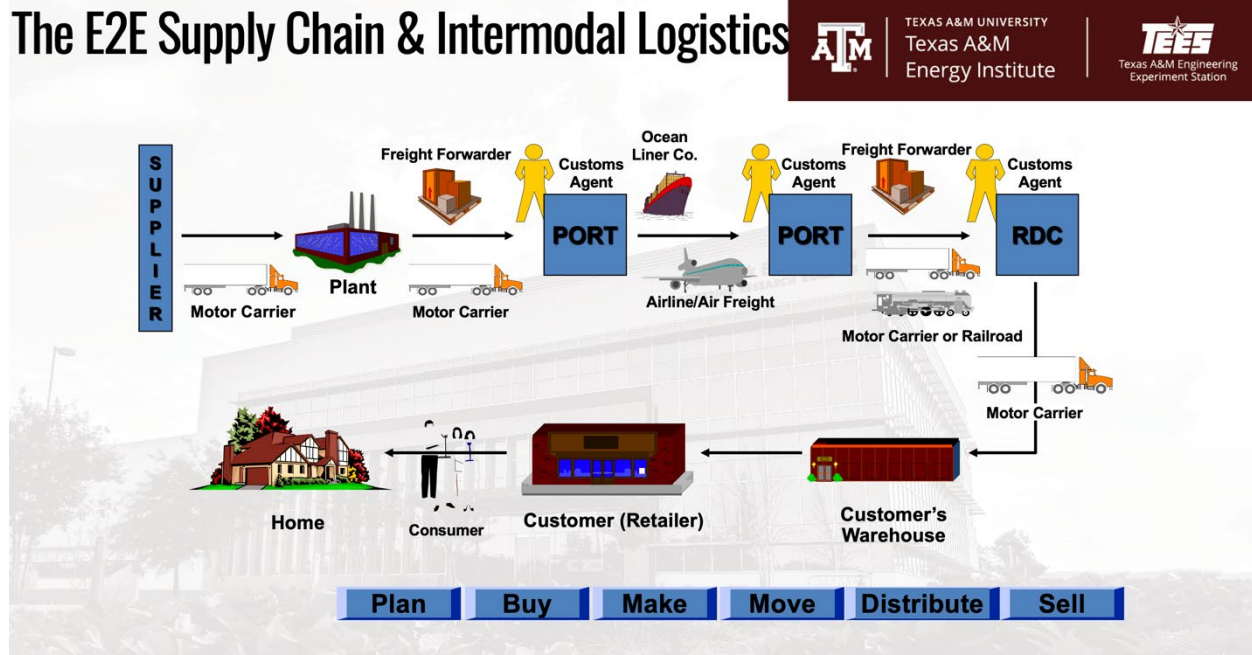


Figure 3. Source: Iakovou, E.

Supply chains in order to be successful, have to manage holistically and in a well-orchestrated manner, throughout the end-to-end (E2E) supply chain (from upstream suppliers to downstream customers) the following four flows:

- a. Flows of materials and products (semifinished and finished) facilitated by intermodal logistics networks (barge, rail, truck, feeder ships, larger container ships, air cargo transportation);
- b. Flows of information and data;
- c. Flows of cash; and
- d. Workflows, along with people and skills. *See Figure 4.*

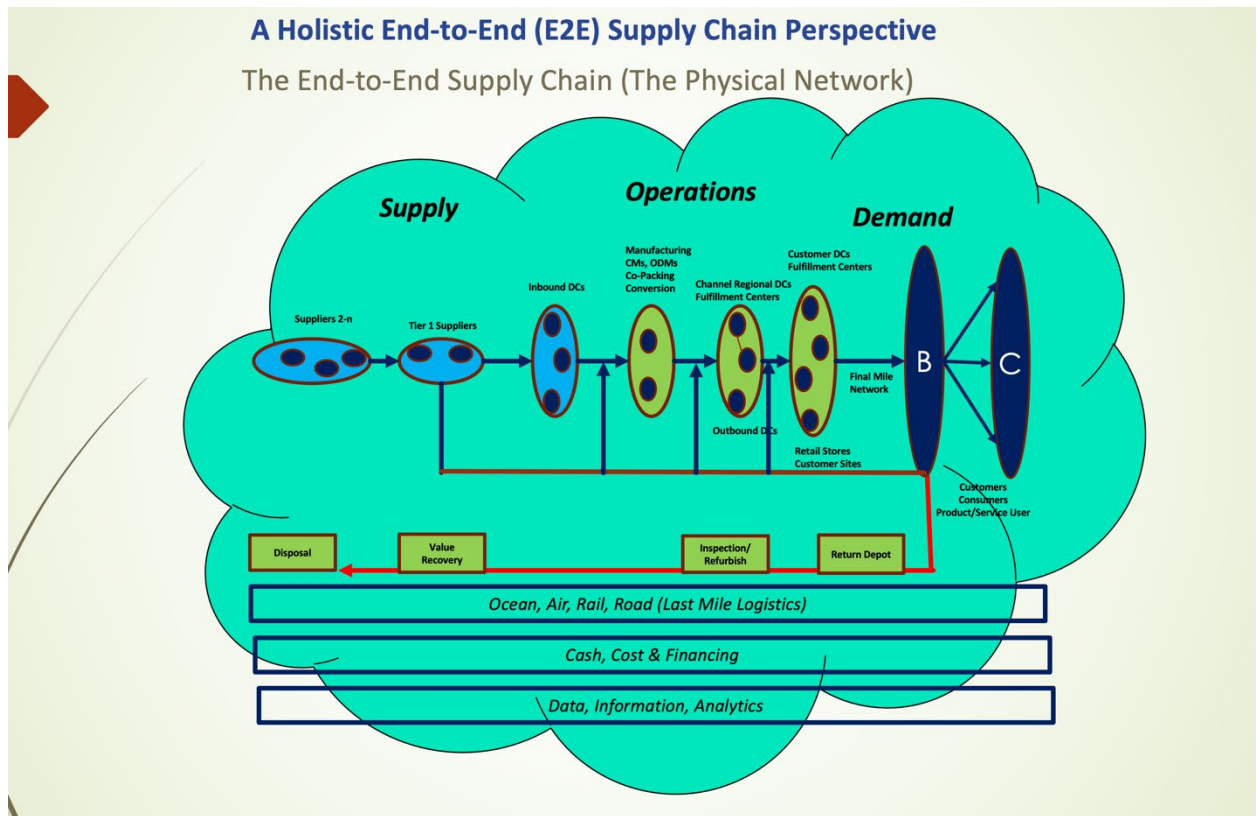


Figure 4. The End-to-End Supply Chain Paradigm. Source: Iakovou, E.

Note: I am not aware of any established international or regional supply chains utilizing lawful commercial navigation traveling up and down the Rio Grande River between Mile Markers 275.5 and 610 or Amistad Dam to Falcon Dam.

What is logistics?

Logistics is the practice and science of managing inventories (*See* also Figure 3):

- in motion (transported, e.g. on a barge, ocean carrier, truck or rail);
- in wait (warehoused, e.g. at a distribution center); and
- in process (manufactured within a factory or assembly facility).

A version of this definition is provided in ⁴ while I further co-shaped and embellished it through my years of working with the authors and my extensive engagement with industry.

Therefore, logistics and transportation management should be viewed as subsets of supply chain management.

Note: Based on my research on historical records, and my knowledge of the current trade flows, I am noting the absence of logistics networks employing any lawful commercial navigation traveling up and down the Rio Grande River between Mile Markers 275.5 and 610 or Amistad Dam to Falcon Dam.

Trends in Global Supply Chains as of 2024:

Beginning in the 1990s and accelerating after the inclusion of China in the World Trade Organization (WTO) in 2001 and driven by commoditization, containerized cargo transportation infrastructure (containers constitute the dominant asset shipped across the *Highway of Commerce*), multinational corporations (MNCs) embarked on a relentless drive for cost efficiencies and access to large markets (mainly China's) with information technology (IT) a key enabler.

To this effect, MNCs globalized their sourcing and production and embraced lean manufacturing techniques (just-in-time/JIT). JIT is a manufacturing technique pioneered by Toyota in the 1970s and it espouses maintaining minimal inventory levels across the manufacturing supply chain in order to minimize costs but also to enhance quality by proactively tackling production quality issues immediately at their source.

⁴ Tyndall, G., Gopal, C., Partsch, W. and Kamauff, J., 1998. "*Supercharging supply chains. New ways to increase value through global operational excellence*", John Wiley & Sons.

JIT cannot be viewed in isolation but rather embedded within a critical stage in the development of supply chain management which focused on *Cost and Working Capital Optimization*, during the advent of globalization, with an emphasis on Enterprise Resource Planning (ERP) software systems to address supply chain planning and specific execution practices, such as warehousing and transportation. This stage coincided with the emergence of China in the global supply chain landscape, its national trade policies and practices, the relaxation of anti-trust regulations in the U.S., and the change in executive compensation policies. Importantly, this led to the “financialization” of the supply chain, by “engineering the balance sheet”, with supply chains driven by lowest product cost, JIT systems, speed and delivery reliability – always with the assumption that the seemingly smooth and seamless flow of goods would continue. During the pandemic we all found out that these supply chains were “built to break”.⁵

As a result of this trend, global trade jumped from 39% of global GDP to 61% between 1990 and 2008 (global financial crisis).⁶ The crisis of 2008 is the first inflection point for global supply chains (the second is the Covid-19 pandemic) as MNCs started realizing that the pendulum had swung too far, and these overstretched lengthy supply chains became rather brittle and vulnerable to a plethora of risks including:

- extreme weather events (e.g. hurricanes, droughts and floods affecting the navigability of rivers, etc.)
- shortages in labor and materials,

⁵ Gopal C., Tyndall, G., Partsch W., Iakovou E., “*Breakthrough Supply Chains: How Companies and Nations Can Thrive and Prosper in an Uncertain World*”, McGraw Hill Professional, 2023, <https://www.breakthroughsupplychains.org/>.

⁶ The Economist, “Globalisation has faltered and is now being reshaped”, 26 January 2019.

- trade wars, tariffs and other geopolitical risks,
- cyberattacks (from nefarious agents and hostile governments alike),
- pandemics,
- demand surges,
- transportation & supplier disruptions,
- macroeconomic risks,
- natural resource and biodiversity risks,
- pollution, poor planning & execution
- social instability.

This realization has led to what is known as “slowbalisation”/deglobalization/ or fragmentation of the world trade with relatively shorter supply chains that are more agile, support national security and employment while being able to satisfy market demand faster. ⁷ Consequently, between 2008-2019 global trade shrunk from 61% to 58% of global GDP. ⁸

Covid-19 is the second major inflection point for global supply chains and the restructuring of the *Highway of Commerce* alike. The pandemic along with the avalanche of “black swan” events that followed (geopolitical tensions with China, the invasion of Ukraine by Russia, the Middle East war, the Houthis’ attacks on ships in the Red Sea, the 2024 Panama Canal drought, etc.), brought into the surface long existing structural problems of global supply chains, further accelerating deglobalization trends and revealing additional risks and threats to the U.S.’s national security and competitiveness. These risks stem mainly from the lack of diversification in sourcing and

⁷ Gopal C., Tyndall, G., Partsch W., Iakovou E., “*Breakthrough Supply Chains: How Companies and Nations Can Thrive and Prosper in an Uncertain World*”, McGraw Hill Professional, 2023, <https://www.breakthroughsupplychains.org/>.

⁸ The Economist, “Special Report: The World Economy”, 10 October 2020.

manufacturing, JIT manufacturing techniques, and the dominance by Chinese state-owned-enterprises/SOEs (supported by aggressive mercantilist strategies including massive subsidies) of critical supply chains such as those of the defense industrial base/DIB, pharmaceuticals/APIs, food, rare earth minerals, semiconductor chips, solar panels, EVs, etc.⁷

The pandemic and trade frictions with China are stark examples of the VUCA (volatile, uncertain, complex, and ambiguous) environment that is putting enormous pressures on international supply chains. Companies and federal agencies now realize that efficiency cannot be the sole economic virtue as it often comes at the expense of resilience.⁹ The above mentioned “black swan” events have exacerbated the need for the development of incentives to reorganize supply chains critical for the defense, security, and competitiveness of the United States. Manufacturers currently emphasize risk assessments, strategic sourcing, supplier diversification, multi-shoring, and nearshoring from Asia (India, Vietnam, etc.) to the Americas, including Mexico and Central America.⁹

In the U.S. these developments further led to the reemergence, after several decades, of industrial policy (see indicatively, the *Inflation Reduction Act*, the *Chips and Science Act* and the latest *Promoting Resilient Supply Chains Act* introduced in the Senate late May 2024) that is disrupting and reshaping global commerce. These disruptive regulatory interventions are to a large degree, a byproduct of a bipartisan focus in Congress on enhancing supply chain resilience embracing a portfolio of *reshoring* (supporting the resurgence in the U.S. of critical types of high value-adding manufacturing), *nearshoring* (e.g. with increased production in Mexico, sourcing from

⁹ “How to build more Secure, Resilient, Next-Gen U.S. Supply Chains”, Eleftherios Iakovou, Chelsea C. White III (Georgia Tech), Brookings Institute TechStream, Dec 3, 2020; <https://www.brookings.edu/techstream/how-to-build-more-secure-resilient-next-gen-u-s-supply-chains/> (Cited in the 2024 Economic Report of the U.S. President).

Canada) and *friend-shoring* (employing supply chains from allies and friendly nations).¹⁰ See also Figure 2 listed above.

We are now entering a new stage in supply chain management, revolving around Customer Life Cycle Experience, Risk Management and Supply Assurance. The End-to-End Supply Chain now encompasses the supply eco-system, manages risks and environmental impacts, considers national security, and uses advanced technologies to enable (and make) processes and decisions. The focus is now on Total Cost, Cash-to-Cash Cycle, and Costs-to-Serve, with total visibility, greater flexibility and resiliency.

More recently, an era of deglobalization is trending. Offshoring has, to a large degree, lost much of its appeal, owing to increased shipping times and costs, geopolitical concerns, national trade policies, national security, increased need for control and proximity to customers. Given this, regionalization, or “friend-shoring”, of supply, manufacturing and final assembly relocations are inevitable.

The supply chains of tomorrow will likely continue to be complex and increase in complexity. Digitalization of processes and business models, risks, increased customer demands and advances in technology will drive analytics and data-driven decisions and trade-offs, innovation in financing and business models, and new strategies for differentiating services for customer benefit.¹¹

¹⁰ Iakovou, E., Robertson, R., “Resilience and Sustainability of Global Value Chains in the Post Covid-19 Era and a Vision for an Integrated North and Central America”; Book Chapter in: *Consequences of Covid-19: An One Health Approach to the Responses, Challenges, and Lessons Learned*, C. G. Blackburn and G. W. Parker (Eds.), Texas A&M University Press, 2024.

¹¹ Gopal C., Tyndall, G., Partsch W., Iakovou E., “*Breakthrough Supply Chains: How Companies and Nations Can Thrive and Prosper in an Uncertain World*”, McGraw Hill Professional, 2023, <https://www.breakthroughsupplychains.org/>.

What is supply chain resilience?

Supply chain resilience refers to the *adaptive capability* of the supply chain to proactively *prepare* for unexpected events, and reactively *respond* to disruptions, and *recover* from them as quickly as possible thus ensuring business continuity and national security.¹²

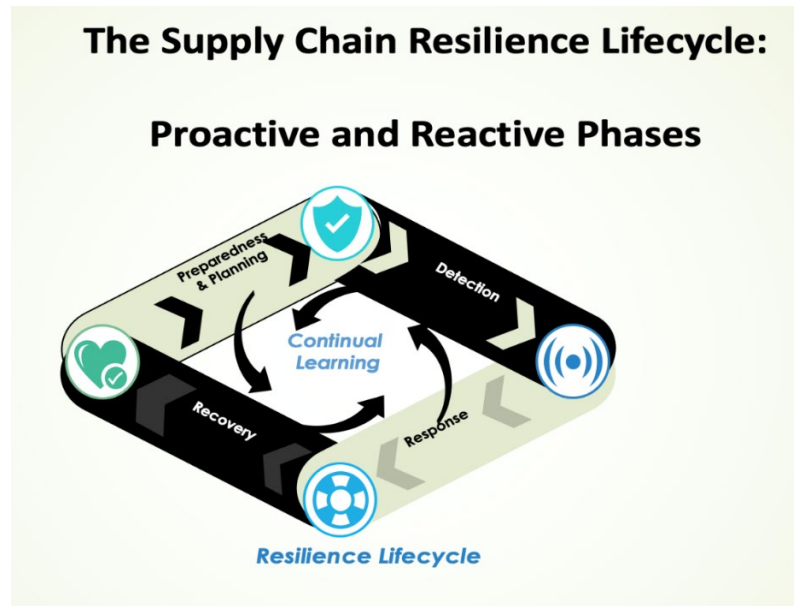


Figure 5. The Supply Chain Resilience Lifecycle. Source: Iakovou, E.

In general, developing supply chain resilience costs money as one needs to build diversification into the design of the supply chain (additional suppliers, additional ports of entry, additional modes of transport, more inventories, etc.) and necessitates the improved coordination of public and private stakeholders across the End-to-End supply chain.¹³ The challenge for policymakers and executives is the development of next-generation data-driven supply chains that are:

- cost-competitively resilient,

¹² "How to build more Secure, Resilient, Next-Gen U.S. Supply Chains", Eleftherios Iakovou, Chelsea C. White III (Georgia Tech), *Brookings Institute TechStream*, Dec 3, 2020; <https://www.brookings.edu/techstream/how-to-build-more-secure-resilient-next-gen-u-s-supply-chains/> (Cited in the 2024 Economic Report of the U.S. President).

¹³ "A Data-Sharing Approach for Great Supply Chain Visibility", Eleftherios Iakovou, Chelsea C. White, *Brookings Institution TechStream*, Sept 14, 2022; <https://www.brookings.edu/techstream/a-data-sharing-approach-for-greater-supply-chain-visibility/>.

- secure, while
- maintaining favorable environmental footprints.

Therefore, what emerges as critical in the design of next-gen supply chains is the study of *optionalities*, namely the ability for decision-makers and planners of logistics networks alike to assess tradeoffs (via scientific tools that allow for the conduct of “what-if” analyses) amongst:

- *supply chain cost,*
- *security,*
- *resilience and*
- *sustainability.*

The identification of supply chain resilience as an enduring national strategic priority for the U.S., is having major repercussions for the design global supply chains; not only for U.S.-based MNCs but also for others that operate and thrive within the U.S. techno-sphere. Importantly, increasingly companies will have to choose their participation in the U.S. or the China techno-sphere.¹⁴ To this effect, a paradigm shift emerges for the next-generation supply chains. These have to be designed and managed in a way that promotes not only cost efficiencies across the end-to-end supply chain but also supply chain resilience along with improved sustainability/environmental footprints, taking into account national security considerations. A new landscape for the *Highway of Commerce* has been emerging; the changes are indeed seismic.

Note: To my knowledge, and despite the exponential growth of nearshored sourcing from Mexico and of the U.S. – Mexico trade (further discussed below), there are not any supply chain

¹⁴ Gopal C., Tyndall, G., Partsch W., Iakovou E., “*Breakthrough Supply Chains: How Companies and Nations Can Thrive and Prosper in an Uncertain World*”, McGraw Hill Professional, 2023, <https://www.breakthroughsupplychains.org/>.

resilience interventions (current or planned) employing the Rio Grande River, as there is not any lawful commercial navigation traveling up and down the River between Mile Markers 275.5 and 610 or Amistad Dam to Falcon Dam.

Intermodal Logistics Networks:

Transportation systems are called *multimodal* when their infrastructure supports various modes for the transportation of goods (or passengers) , such as truck, rail, air, and ocean/river navigation with carriers operating and offering integrated transportation services on these modes under a single transport contract.¹⁵

Intermodal freight transportation refers to the transportation of freight (mostly containerized cargo) by employing sequentially at least two different modes, where the cargo carried is loaded into an intermodal loading unit for the entire duration of the journey, which enables the efficient transshipment from one mode of transport to another (such as transport of a container first by road and then by a barge on an inland waterway).¹⁵ Changes of modes are occurring in *intermodal terminals* including inland terminals such as river ports, airports and rail yards or seaport terminals.¹⁵

Intermodal logistics networks take advantage of containerized cargo to move freight efficiently (*fast, cost effectively, reliably and consistently*) over long haul distances *from origin to destination* (OD pairs) using various modes and intermodal terminals for cargo consolidation. For example, loaded containers can leave a shipper's facility (a manufacturer or an OEM/original

¹⁵ De Leijer, H., Quispel, M., Van Putten, S., Van Liere, R., 2015. "Inland Waterways Transport", *Good Practice Manual and Reference Guide, Rotterdam*. Composed for The World Bank.

equipment manufacturer) somewhere in Europe or Asia via trucks to a rail yard where they are consolidated with other cargo and are then transported by rail to a port terminal. They can then cross an ocean via a carrier's container ship and reach a U.S. port. Once offloaded from the vessel (and usually after having been stored in a port container terminal's yard) they can then be moved to either a smaller feeder ship for what is known as *shortsea shipping transportation*, or to trucks (light or heavy duty), rail or barges for hinterland transportation (employing intermodal terminals) until they reach the yard or distribution center of the end customer. ¹⁶

¹⁶ Mallidis I., Iakovou E., Dekker R., Vlachos D., 2017. "Impact of Slow Steaming on the Carrier's and Shipper's Costs: The Case of An Asia to Europe Logistics Network"; *Transportation Research Part E: Logistics and Transportation Review*; 111, pp. 18-39.

EP: Entry Port

DC: Distribution Center (central and regional)

RS: Retail Store

SDC: Satellite DC

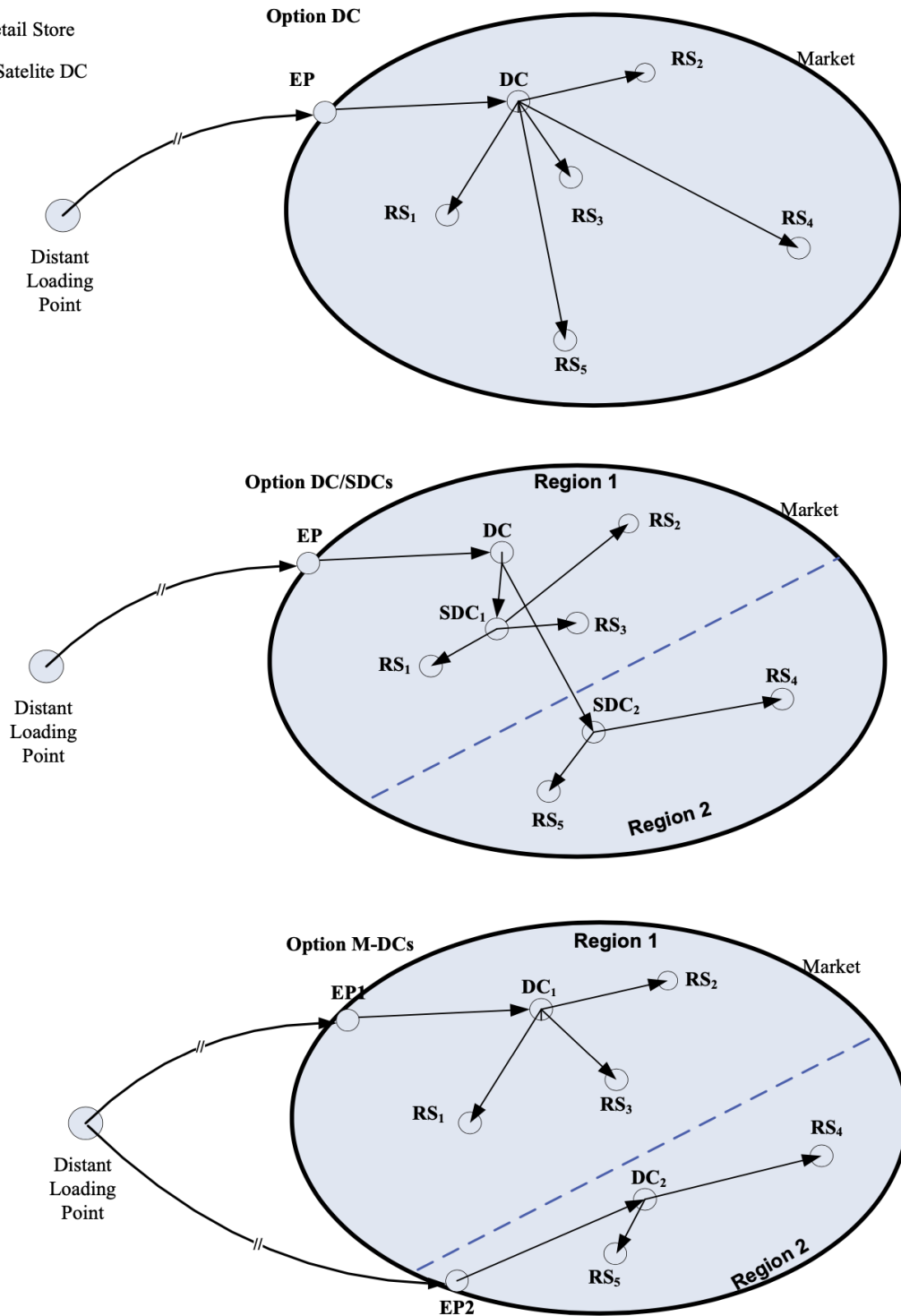


Fig. 1. Logistics network design options.

Figure 6. An illustrative example of alternative logistics design networks for shipment containers from Europe or Asia entering the U.S. (through various ports of entry, hinterland multimodal transportation modes and distribution centers) in order to serve regional markets.¹⁶

The logistics infrastructure (ports, rivers, highways, rail corridors) forms the backbone of today's *Highway of Commerce* upon which supply chains and operate. This infrastructure has been struggling to keep up with the relentless demand for reduced end-to-end supply chain cost which has led among other things, to the construction of ever larger container ships. To a large degree the Baltimore's Francis Scott Key Bridge collapse after the collision of a moderate size container ship (the Dali with 10,000 Twenty-foot Equivalent Units (TEUs)) is an ominous reminder that a lack of modifications to accommodate today's container ships can put our aging waterways' infrastructure at risk (ports, canals and bridges). Port and civil structures are usually constructed for a lifespan of over 50 years, while that number is only 20 to 30 years for a ship. Therefore, infrastructure is always playing catch-up, leading to significant lags between ship size and improved versions of port and bridge infrastructure.¹⁷

To this effect, the Panama Canal Authority spent more than \$5B (from 2007 to 2016), under the Third Set of Locks Project, doubling its capacity by adding a new traffic lane, enabling more ships to transit the waterway, and increasing the width and depth of the lanes and locks, allowing larger ships to pass. The new ships, called Neopanamax, can carry about 14,000 TEUs, while the previous Panamax vessels are capped at 5,000 TEUs. However, the expansion was outpaced by the modern rapid commerce developments and logistics advances.¹⁸ As a result, today

¹⁷ The Smithsonian Magazine, March 28, 2024 <https://www.smithsonianmag.com/smart-news/cargo-ships-keep-getting-bigger-and-infrastructure-is-racing-to-keep-up-180984043/>

¹⁸ Maritime Executive, August 3, 2023; <https://maritime-executive.com/article/panama-canal-s-limits-force-new-largest-boxship-to-offload-before-transit>

the large mega carriers (18,000 TEUs or more) cannot go through the canal. Today's Ultra-Large Container Vessels (ULCV) carry cargo in excess of 20,000 TEUs (up to 24,000 TEUs).

Initially the Neopanamax Locks were expected to serve vessels with a maximum of 12,600 TEUs. However, the cap has been surpassed somewhat as experience in operating the locks grew. On August 1, 2023, the Ever Max container ship (owned by the Taiwanese Evergreen) became the largest capacity container ship that was able to go through the Neopanamax locks of the Panama Canal. But there was a caveat. The ship has a nominal capacity of 17,312 TEUs. She arrived from Asia at the Pacific side of the canal with 14,745 TEUs. However, as her maximum draft, exceeds the canal's normal 50-foot maximum for the Neopanamax locks, the Panama Canal required the container ship to reduce its load to 13,345 TEUs to meet the 44-foot maximum permitted draft. 1,400 TEUs had to be transshipped across the isthmus.¹⁸



Figure 5. Ever Max became the largest container ship to transit the Panama Canal on 8/1/2023 but was required to offload 1,400 boxes due to draft restrictions. Source: Maritime Executive¹⁸

The implications of the Canal's expansion are significant for global shipping shifting container flows to East Coast and Gulf Coast ports. It has been affecting the investment and routing decisions of rail and truck carriers and the trade-offs that shippers make between the cost and the speed of transportation, also altering the location of distribution centers. However, due to its limitations described above, when carriers and shippers want to divert flows from the East Coast (as in the case during the Covid-19 Pandemic) to Ports of Texas container ships with more than 15,000 TEUs cannot go through the Canal.



Figure 8: Container Ship Routes to North America from Asia Pacific. Source: Wikipedia

Note: To my knowledge, there are no intermodal logistics networks enabling (or enabled by) any lawful commercial navigation traveling up and down the Rio Grande River between Mile Markers 275.5 and 610 or Amistad Dam to Falcon Dam.

Inland Waterway Transportation:

Maritime freight transportation plays a crucial role in moving goods and supporting the national and global economy. Today, about 90 percent of globally traded goods are carried across oceans (mainly employing containers), and maritime trade volumes are set to triple by 2050 as demand increases.¹⁹

In the U.S., waterborne freight activities contribute more than \$500 billion to the annual GDP and support over 10 million jobs.²⁰ An important component of maritime freight transportation is inland waterway transportation (IWT) which employs rivers, channels, canals, and intra-coastal waterways.²¹ Compared to using land transportation modes, IWT has significant cost and energy advantages; the transportation cost per ton-mile by IWT is only one-ninth that of trucking and two-thirds that of rail; and for bulk cargo, the average energy consumption using IW navigation is about a quarter that of trucking and half that of rail.²¹

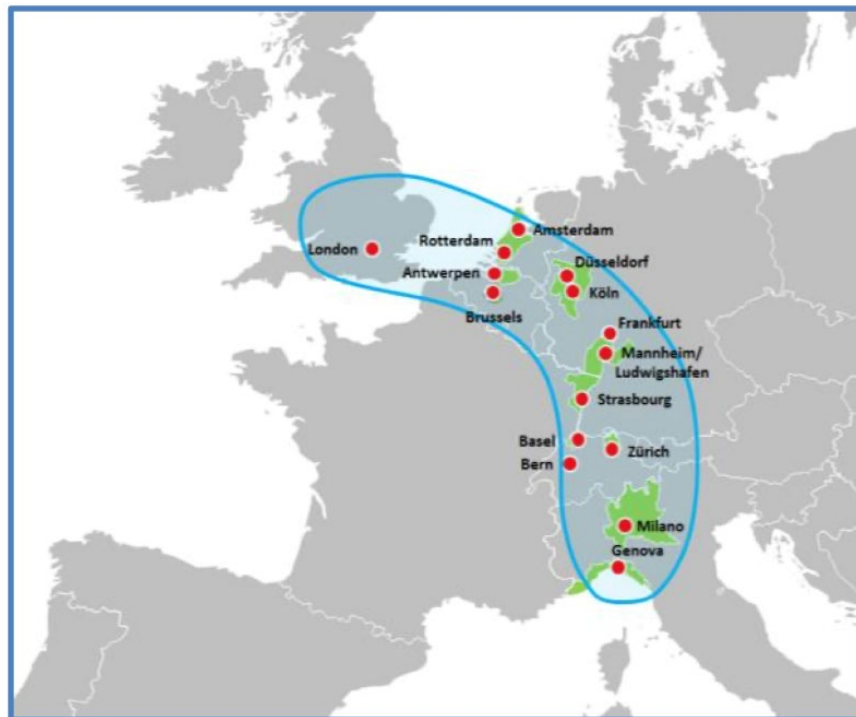
IWT can significantly contribute to the sustainable development of port-hinterland connections. By utilizing barges that can transport the equivalent of 200 trucks on average, IWT displays reduced external transport costs.²¹ Its minimal generation of accidents, noise, congestion, habitat damage, and emissions has spurred global policy agendas to encourage its utilization toward a more sustainable freight transport market structure.²²

¹⁹ The Smithsonian Magazine, March 28, 2024 <https://www.smithsonianmag.com/smart-news/cargo-ships-keep-getting-bigger-and-infrastructure-is-racing-to-keep-up-180984043/>.

²⁰ Farazi, N. P., Zou, B., Sriraj, P. S., Dirks, L., Lewis, E., Manzanarez, J. P., 2022. "State-level performance measures and database development for inland waterway freight transportation: A US context and a case study", *Research in Transportation Business & Management*, 45, p.100866.

²¹ Bedoya-Maya, F., Shobayo, P., Beckers, J., Van Hassel, E., 2024. "The impact of critical water levels on container inland waterway transport", *Transportation Research Part D: Transport and Environment*, p.104190.

IWT is widely employed throughout the European Union and its expansion is carefully crafted to support the EU's Trans-European Transport Network (TEN-T).²² A leading IWT corridor for the EU is the navigable Rhine-Alpine Corridor (RALP). The 2,150 miles long RALP is one of the busiest inland waterway transportation corridors in the world, connecting the seaports of the North Sea with northern Italy, by linking Belgium, the Netherlands, France, Germany, Luxembourg, Switzerland, and Italy while employing roughly 40 inland terminals and handling over 400 million tons of cargo per year. RALP is the most important trade corridor for the EU. Almost all inland containerized cargo in Europe passes through RALP.²³ To my knowledge, there is nothing comparable in the United States or South America.



²² Bedoya-Maya, F., Shobayo, P., Beckers, J., Van Hassel, E., 2024. "The impact of critical water levels on container inland waterway transport", *Transportation Research Part D: Transport and Environment*, p.104190.

²³ Bedoya-Maya, F., Beckers, J., Van Hassel, E., 2023. "Spillover effects from inland waterway transport development: Spatial assessment of the Rhine-Alpine Corridor", *Journal of Transport Geography*, 113, 103721.

Figure 9. The RALP Corridor. Source: European Commission

Despite the importance of IWT and its cost and energy advantages, IWT freight transportation has not been paid much attention to in the U.S. The U.S. inland waterways consist of more than 36,000 miles of rivers, canals, channels, and waterways²⁴ of which about 12,000 miles have commercial navigability.²⁵ The nation's navigation is maintained by 239 lock chambers at 193 lock sites that are owned, maintained, and operated by the US Army Corps of Engineers²⁵. A large volume of freight is carried by waterborne modes. The total freight tonnage and value carried by waterborne modes remained steady in recent years, at around 800 million tons and \$450,000 million, respectively.²⁶

Note: As of the writing of this report, none of this activity is conducted on the Rio Grande River between Mile Markers 275.5 and 610.

To maximize its potential in reducing negative transport externalities and enhancing regional economic growth, the competitiveness of IWT depends upon maintaining navigable conditions and developing resilient designs and responses to extreme weather events, which due to climate change are expected to intensify. These include droughts leading to very low water conditions which can reduce the vessels' loading capacity, and floods leading to high water levels undermining the integrity of the transport infrastructure.²⁷

²⁴ NRC (2015). National Academies of Sciences, Engineering, and Medicine, "Funding and Managing the US Inland Waterways System: What Policy Makers Need to Know", Washington, DC: The National Academies Press.

²⁵ USACE (2017). *U.S. Army Corps of Engineers. Navigation and Civil Works Decision Support Center. The U.S. Waterway system 2016 transportation facts & information.*

²⁶ Farazi, N. P., Zou, B., Sriraj, P. S., Dirks, L., Lewis, E., Manzanarez, J. P., 2022. "State-level performance measures and database development for inland waterway freight transportation: A US context and a case study", *Research in Transportation Business & Management*, 45, p.100866.

²⁷ Bedoya-Maya, F., Shobayo, P., Beckers, J., Van Hassel, E., 2024. "The impact of critical water levels on container inland waterway transport", *Transportation Research Part D: Transport and Environment*, p.104190.



Figure 10. The U.S. National Inland Transportation System. Source: Wikipedia

Figure 9 illustrates the six major corridors that move substantial tonnages of waterborne commerce: the Upper Mississippi River, the Lower Mississippi River, the Ohio River, the Gulf Intracoastal Waterway (GIWW), the Illinois River, and the Columbia River system. These six river corridors represent 80 percent of the commercial lockages. For perspective, the miles of waterway on the six corridors represent about 16 percent of the total 36,000 inland river miles. These six rivers carry about 50 percent of the cargo transported (in ton-miles) on the inland waterways.²⁸

²⁸ NRC (2015). National Academies of Sciences, Engineering, and Medicine, “Funding and Managing the US Inland Waterways System: What Policy Makers Need to Know”, Washington, DC: The National Academies Press.

The largest commodities shipped via U.S. inland waterways by tonnage or volume are coal, petroleum products, agricultural products, aggregates, and chemicals. Some of the major commodity corridors for the inland waterways are: ²⁹

- Coal corridor: Ohio River system, including the Allegheny and Monongahela Rivers;
- Food and farm corridor: Upper Mississippi and Illinois Rivers to New Orleans, Louisiana;
- Petrochemical corridor: Mississippi River from Saint Louis, Missouri, to New Orleans;
- Manufactured goods corridor: Mississippi River from Saint Louis to New Orleans;
- Crude materials corridor: Ohio and Upper Mississippi Rivers (from Saint Louis) to New Orleans;
- Food and farm corridor: Columbia River system, including Columbia, Snake, and Willamette Rivers;
- Chemical and petroleum goods corridor: Gulf Intracoastal Waterway.

The Gulf Intracoastal Waterway

The Gulf Intracoastal Waterway provides a protected route along the Gulf Coast from Saint Marks, FL, to the Mexican border at Brownsville, TX. Its total distance is 1,109 miles, the maintained minimum channel depth is 12 feet, and the system includes 10 locks. The Inner Harbor Navigation Canal lock at New Orleans connects the Mississippi River to the GIWW and overcomes elevation differences between the river and the canal. The lock is currently one of the most congested on the entire inland waterways system.

Given GIWW's location in the largest petrochemical region of the United States, petroleum and chemicals dominate the system's commodity flows. Together they made up 76.5

²⁹ Failure to Act: Ports and Inland Waterway - Anchoring the U.S. Economy, American Society of Civil Engineers, January 2021.

percent of the tonnage in 2012. Crude materials ranked third, at nearly 15 percent. Pipelines are the main competing and complementary mode.³⁰

Running more than 400 miles across the State of Texas and over 1,100 miles to its end in Florida, the GIWW is an aquatic superhighway longer than the Erie Canal in New York. It connects ports from Brownsville up past Corpus Christi to Freeport, Houston, and the Sabine River, extending into Louisiana and through the Mississippi Delta. Completed in the late 1940s as a commercial trade route, the GIWW in Texas constitutes one of the state's most audacious engineering efforts and has reshaped commerce and industry. It has been a huge benefit to the oil and gas industry. Petroleum products make up more than 60% of the up to 90 million tons of freight transported along the GIW each year.³¹

Note: The GIWW does not connect to the Rio Grande River.



Figure 11: Tug and Barges on the Gulf Intracoastal Waterway. Source: Wikimedia Commons

³⁰ NRC (2015). National Academies of Sciences, Engineering, and Medicine, "Funding and Managing the US Inland Waterways System: What Policy Makers Need to Know", Washington, DC: The National Academies Press.

³¹ Texas Highways; <https://texashighways.com/things-to-do/on-the-water/intracoastal-waterway-connects-texas-florida/>.



Figure 12: A Barge carrying petrochemicals on the GIWW. Source: Texas Highways

Note: To my knowledge (based on expert reports, depositions, my research and my reviewing aerial videos across the Rio Grande sent by the Texas legal team on June 8, 2024) , the sorts of barges displayed in Figures 11 and 12 cannot operate on the Rio Grande River as it currently exists between Mile Markers 275.5 and 610.

Required Navigational Depth and Investments

An inland waterway network needs to be well maintained to allow sufficient depth for efficient transport of goods via inland vessels. The improvement of the waterway infrastructure quality can further reduce air pollutants and greenhouse gas emissions, as the removal of infrastructural bottlenecks and the maintenance of waterways (e.g. dredging) increases the possible load rate of a vessel and allows larger vessels to sail and to benefit from economies of scale (an

imperative for logistics). By increasing the load factor and transporting cargo more efficiently, the fuel consumption as well as the emissions per loading unit is reduced. Importantly, during dry/low water periods could induce a negative modal shift (to rail, or truck). In low water, usually, higher levels of fuel consumption are required to attain the same velocities (due to higher resistance). Well maintained waterways are therefore not only important for enabling the economic efficiency of transport but also for the fuel consumption and the environmental performance. In Europe the TEN-T corridor network includes a minimum waterway depth of 2.5 meters (8.2 feet), to be part of its network.³²

In the U.S, in a publication posted on USDA's website (Chapter 12, Barge Transportation) regarding the navigation of the Mississippi river it is noted:

Finally, in 1930, Congress authorized the U.S. Army Corps of Engineers (Corps) to construct and maintain a navigation channel 9 feet deep with a minimum width of 400 feet. Passage of this authorization marked the beginning of a massive dam-building program that built the 29 locks on the Upper Mississippi River and 8 locks on the Illinois River.³³

Furthermore, according to the American Society of Civil Engineers: "Inland waterways require channel depths of up to nine feet and have significant infrastructure by way of locks and dams that allow continuous navigation as river water levels change".³⁴

From a publication of the Civil Engineering Program, Gujarat University, India:

The chief requirement for navigating through a waterway is the availability of sufficient water depth in the waterway. A minimum water depth of about 2.7 meters (8.8. feet) is generally required for navigating safely and economically; although a depth of about 3.7 meters (12.1 feet) is generally aspired in the final development of a navigable waterway.

³² De Leijer, H., Quispel, M., Van Putten, S., Van Liere, R., 2015. "Inland Waterways Transport", *Good Practice Manual and Reference Guide, Rotterdam*. Composed for The World Bank.

³³ <https://www.ams.usda.gov/sites/default/files/media/RTIReportChapter12.pdf>.

³⁴ Failure to Act: Ports and Inland Waterway - Anchoring the U.S. Economy, American Society of Civil Engineers, January 2021.

Availability of lesser depth in the rivers may completely eliminate the possibility of towing the ships through such rivers or may cause increased unit cost of transport.³⁵

In general, IWT is significantly affected by changes in the waterway hydrology, especially as ever-increasing extreme weather events lead to longer periods with strong water swells and drops. To allow fully loaded barges, the water level must be neither too high (limited air draught) nor too low (limited draught). Therefore, the water level impacts the load factor of barges and thus the transportation costs.³⁶

To comply with such restrictions, the ship will have to be loaded only to such an extent that a certain minimum clear space remains available between the bottom of the ship and the bottom of the river. Therefore, the amount of loading of a barge is dependent and limited by the availability of sufficient water depth at the bottleneck (shallowest) point in the route.

In conclusion: a certain minimum depth depending upon the type and extent of traffic is required to be maintained in the river, so as to keep it fit for shipping or towing of barges. When this available depth or draft is not sufficient or if the channel width, channel alignment, locking time, current velocity, terminal facilities, etc. are not adequate, engineering measures and additional investments need to be undertaken. Furthermore, a lack of harmonization of depths of rivers involved in the same IWT can undermine the corridor's performance as barges would need to offload potentially cargo to comply with minimum depth requirements as they move from one river to the other.

Note: I was unable to find any waterways with less than 8 feet of depth that operate as highways of commerce in the USA.

³⁵ [https://civilpddc2013.weebly.com/uploads/2/2/5/5/22556782/25 - river navigation.pdf](https://civilpddc2013.weebly.com/uploads/2/2/5/5/22556782/25_-_river_navigation.pdf).

³⁶ A. Caris, S. Limburg, C. Macharis, T. Van Lier, and M. Cools. "Integration of inland waterway transport in the intermodal supply chain: a taxonomy of research challenges", *Journal of Transport Geography*, 41 (2014) 126-136.

When we discuss the usage of a river for commercial navigation, terminal facilities (including inland ports), across an IWT corridor are essential.³⁷ Economies of scale and more multimodal operations reduce internal transport costs as well as externalities such as congestion on roads, noise and greenhouse gas emissions. These terminal facilities are often embedded within inland ports located across the waterway offering:

- A seamless interface among IWT and land and rail transport
- Serving as gates to major seaports
- An interface between long-haul transport and local logistics (last mile/city logistics).

See Figure 13 for a best-case implementation.



³⁷ De Leijer, H., Quispel, M., Van Putten, S., Van Liere, R., 2015. "Inland Waterways Transport", *Good Practice Manual and Reference Guide, Rotterdam*. Composed for The World Bank.

Figure 13. Intermodal Logistics Terminal (From Barge-to-Rail) at Duisport, Germany, the largest inland port in the world with seamless connections to the seaports of Antwerp and Rotterdam.³⁸



Figure 14. Container Ship (Smaller Feeder Vessel) and Container Cranes in Oakland Inner Harbor. Source: Wikimedia Commons

The pressures for reduced unit shipping cost are relentless leading to the construction of even larger vessels (from 18,000 TEUs to 24,000 TEUs). Ports around the world and in the US are investing heavily to increase their depths to be able to accommodate such vessels with the additional necessary modification for their terminal cranes to be able to reach containers stacked to the full capacity. Ports and operators of Port Container Terminals will do whatever is feasible

³⁸ De Leijer, H., Quispel, M., Van Putten, S., Van Liere, R., 2015. "Inland Waterways Transport", *Good Practice Manual and Reference Guide, Rotterdam*. Composed for The World Bank.

(subject to spatial, financial and regulatory constraints) to embed themselves in the most competitive globalized supply chain networks as the costs of exclusion are dire. *See* Figures 14-16.



Figure 15: Container Terminal, Container Cranes and Yard at the Port of Miami. Source Wikimedia Commons



Figure 16: The CMA CGM Benjamin Franklin (18,000 TEUs) docking at the Port of Los Angeles with the adjacent Container Cranes Infrastructure of the Terminal. Source: Wikimedia Commons.

Note: I am aware of no such infrastructure currently existing on the Rio Grande River between Mile Markers 275.5 and 610.

4. Illicit Trade and Labor Compliance Pose Alarming Risks for Cross-Border Supply Chains

Globalized supply chains increase the risk of illicit trade, including forced labor, human trafficking, sex trafficking, child exploitation, organ removal, counterfeiting, terrorist threats, transnational smuggling (endangered wildlife, prohibited drugs and opioids, and weapons) and violations of national labor law and international labor standards. Illicit trade poses an alarming

threat to national economies, businesses, environment, tax revenues, public health and national security.

The problem of ensuring security while still supporting trade is quite challenging. Specifically, policymakers and security agencies need to consider adversaries (i.e. drug cartels, terrorist groups) who, instead of destroying or disabling an international supply chain, use instead containerized cargo in the supply chain network as a targeted delivery platform by transporting illegal or unauthorized goods (including e.g. nuclear weapons) into the U.S. ³⁹

Secondly, there are upstream manufacturers who, while perhaps lacking an explicit criminal intent, may choose illicit labor practices in factories to produce otherwise legitimate goods exported as part of global supply chains. ⁴⁰ In both cases, many of the adversaries' behaviors and activities are hidden, while these adversaries are sophisticated, tech-savvy, nimble and infamous for their capabilities in efficiently adapting to the environment.

To this effect, it is well-documented that drug traffickers in Central and Latin America have been applying Walmart's best practices (supply chain management is a core competence for Walmart) when it comes to leveraging the supply chain. ⁴¹ For example, drug cartels maintain exclusive relationships with their "suppliers" (the farmers who grow the coca plants) that allow the cartels to keep the price of cocaine stable even when crop production is disrupted (a practice which is at the core of Walmart's sourcing and supply chain strategy).

³⁹ Bakir, N. O., Pakdaman, D., 2006. "An Analysis of Truck Cargo Security at Southwestern Borders and Potential Impacts of Cross-Border Trucking services of Mexican Carriers on Terrorism Risk Exposure", CREATE DHS Center.

⁴⁰ Iakovou, E., Robertson, R., "Resilience and Sustainability of Global Value Chains in the Post Covid-19 Era and a Vision for an Integrated North and Central America"; Book Chapter in: *Consequences of Covid-19: An One Health Approach to the Responses, Challenges, and Lessons Learned*, C. G. Blackburn and G. W. Parker (Eds.), Texas A&M University Press, 2024.

⁴¹ Wainwright, T., 2016. "*Narconomics: How to run a drug cartel*", PublicAffairs.

The National Drug Intelligence Center has long determined that it is possible for drug traffickers to use commercial trucks to smuggle illicit drugs in the U.S. U.S. Customs and Border Protection (CBP) has repeatedly reported seizures of cocaine and marijuana found in trucks entering the U.S. from Mexico. Mexican drug traffickers are sophisticated and savvy about NAFTA policies having identified which products are moving faster through border inspection. Drug cartels often employ a technique called “shot gunning” under which large amounts of drugs are divided into smaller segments and distributed throughout different shipments that go through CBP checkpoints simultaneously. In other cases, they employ a decoy truck to distract inspectors, while a second truck carrying drugs passes the border. There are even reported cases where cartels bought legitimate manufacturing plants in Mexico and used their cargo shipments to transport illegal drugs.⁴²

An additional security concern from cross-border trade stems from the potential relationship between drug smugglers and terrorist agencies. Cargo shipments present a risk in that they can be used to smuggle weapons (conventional, chemical, biological, radiological or nuclear weapons), other types of contraband, or people (as in immigrant smuggling in vessel containers, potential terrorists, etc.). This risk is possible not only for vessel-borne containers, but also for containers transported by truck containers, or even rail. The Congressional Research Service asserts that any type of smuggler may pose a national security threat (“the same groups that

⁴² Bakir, N. O., Pakdaman, D., 2006. “An Analysis of Truck Cargo Security at Southwestern Borders and Potential Impacts of Cross-Border Trucking services of Mexican Carriers on Terrorism Risk Exposure”, CREATE Homeland Security Center.

smuggle cigarettes across the border today may smuggle drugs or weapons tomorrow”).⁴³ As discussed also below, trade with Mexico is highly vulnerable to security breaches.³⁸

Finding policy solutions that increase both security and efficiency (via lower trade costs) while ensuring supply chain resilience is both challenging and important for economic growth and security. Traditionally, regulators and governmental agencies have been struggling to cope with the increased trade flows at various ports of entry, as these are embedded within globalized supply chain networks, while attempting to balance trade security versus trade facilitation.⁴⁴

Indicatively, CBP has undertaken several initiatives to strengthen the safety and security of containerized cargo. Such programs are realized by expanding the U.S. Borders and working with host nations at approved supply nodes of the hosting nation; they include among others, the Customs Trade Partnership Against Terrorism (C-TPAT)⁴⁵ and the Container Shipping Initiative (CSI)⁴⁶ initiatives. The last few years CBP has been looking into the role of Blockchain for shaping the “customs of the future” and to provide real-time visibility and traceability across the global supply chain. I have worked under a funded research project from DHS to this effect.⁴⁷ This cited paper is an output of my research further outlining the value proposition of Blockchain for global supply chains and cross-border trade and has received wide attention with more than 600 citations from researchers globally.

⁴³ Lake Jennifer, et al. Border and Maritime Security: The Complexity of the Challenge. *Congressional Research Service*, RL32839, March 2005.

⁴⁴ <https://www.osce.org/files/f/documents/b/7/92421.pdf>.

⁴⁵ <https://www.cbp.gov/border-security/ports-entry/cargo-security/CTPAT>.

⁴⁶ <https://www.cbp.gov/border-security/ports-entry/cargo-security/csi/csi-brief>.

⁴⁷ Chang Y., Iakovou E., and Shi W., 2020. “Blockchain in Global Supply Chains and Cross Border Trade: A Critical Synthesis of the State-of-the-Art, Challenges and Opportunities”; *International Journal of Production Research*, Vol. 58, No. 7, pp. 2082-2099, DOI: [10.1080/00207543.2019.1651946](https://doi.org/10.1080/00207543.2019.1651946).

The potential and incentives for nearshoring from the Americas create unique challenges to bolster security and facilitate trade along the U.S. Southwest border and to address relevant supply chain risks. The Southwest border faces pressing challenges and has been the focus of several interventions by the federal government. An April 4, 2018, U.S. Presidential Memorandum directed the Department of Homeland Security (DHS) and the Department of Defense (DoD) to address pressing national security threats along the Southwest border. The result was Operation Guardian Support that deployed more than 2,000 National Guard personnel to assist CBP with its border security operations. As part of this joint mission, CBP officers and Border Patrol agents could focus on their core functions, enforcing immigration laws and narcotics seizures to better secure the border. During FY18, Operation Guardian Support made a significant impact, leading to more than 23,000 arrests and the seizure of more than 35,700 pounds of illicit drugs across the 8 Southwest border sectors.⁴⁸

A June 4, 2024, Presidential Proclamation from President Biden focuses on enhancing the security of the Southwest border. The Secretary of Homeland Security and the Attorney General also jointly issued an interim final rule that, consistent with the Proclamation, generally restricts asylum eligibility for those who irregularly enter across the southern border – including the Southwest land and the southern coastal borders. The restriction on asylum eligibility will be discontinued when encounters fall below certain levels but will come back into effect if encounters rise again.⁴⁹

⁴⁸ cbp.gov/sites/default/files/assets/documents/2019-Mar/CBP-Border-Security-Report-FY2018.pdf.

⁴⁹ <https://www.dhs.gov/news/2024/06/04/fact-sheet-presidential-proclamation-suspend-and-limit-entry-and-joint-dhs-doj>.

Furthermore, sourcing from regions where labor or other human rights abuses are common and from new suppliers who have not been fully vetted and screened, further increases the risk of dealing with less reputable or even restricted parties and exposes companies to corporate liability for supplier abuses, including forced labor and labor violations. A wide range of policies and programs have been implemented to address labor compliance risks in global supply chains. As a harbinger of policies to come, on February 21, 2017, France adopted a “duty of vigilance” law that requires multinational corporations to establish and effectively implement due diligence measures to identify and prevent human rights violations in connection with their operations (similar legislation was then enacted in the U.S. as discussed below) ⁵⁰.

Since 2016, CBP has issued 29 Withhold Release Orders and blocked more than \$100 million of goods from U.S. markets as a result of information indicating forced labor. CBP notes that these enforcement actions are unique in the world. ⁵¹ Rising concerns about labor conditions in China have led CBP to restrict imports from China that have been linked to forced labor. The Uyghur Forced Labor Prevention Act (UFLPA)⁵² enacted on June 22, 2022, is already impacting procurement and supply chain operations across many industries. ⁵³ It assumes that any work performed in China’s Xinjiang region is forced. To avoid disruptions, importers will need to prove to CBP that forced labor was not used for any products coming from that territory. Indicatively only, in February of 2024 thousands of VW vehicles (under the brand names of Porsche, Audi and

⁵⁰ Gopal C., Tyndall, G., Partsch W., Iakovou E., “*Breakthrough Supply Chains: How Companies and Nations Can Thrive and Prosper in an Uncertain World*”, McGraw Hill Professional, 2023, <https://www.breakthroughsupplychains.org/>.

⁵¹ <https://www.cbp.gov/newsroom/national-media-release/cbp-team-selected-finalist-service-america-medal>.

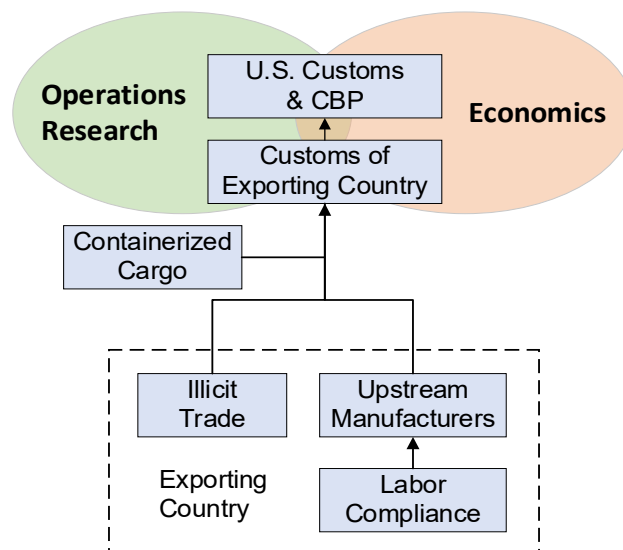
⁵² <https://www.cbp.gov/trade/forced-labor/UFLPA>.

⁵³ Gopal C., Tyndall, G., Partsch W., Iakovou E., “*Breakthrough Supply Chains: How Companies and Nations Can Thrive and Prosper in an Uncertain World*”, McGraw Hill Professional, 2023, <https://www.breakthroughsupplychains.org/>.

Bentley) were impounded by CBP on US Northeastern ports after a part in the vehicles was found to violate UFLPA. The banned part was a small electronic component part of a larger control unit.

In response to these developments, companies are under tremendous pressures of compliance. A first step in compliance involves the conduct of laborious time-consuming mappings of their entire end-to-end supply chains.⁵⁴ (See also Figure 2 for an illustrative example of supply chain mapping).

Understanding supply chain risks, and finding solutions that disrupt illicit activities, are now priority issues for both the private and public sectors. In this context, a major challenge for governments, private sector firms, and law enforcement agencies is the development of new collaborative frameworks to safeguard legitimate commercial supply chains safe from illicitly sourced labor and illicit trade. See Figure 17.



⁵⁴ Gopal C., Tyndall, G., Partsch W., Iakovou E., “*Breakthrough Supply Chains: How Companies and Nations Can Thrive and Prosper in an Uncertain World*”, McGraw Hill Professional, 2023, <https://www.breakthroughsupplychains.org/>.

Figure 17: A Holistic Framework for Safeguarding Supply Chains against Illicit Trade (Source: Iakovou, E.).

Note: In this risky trade environment susceptible to illicit trade and security breaches further exacerbated by immigration issues at the U.S. Southwestern Border, to my knowledge there is no U.S.-Mexico trade (not even historically) that is traveling up and down the Rio Grande between Mile Markers 275.5 and 610.

5. US-Mexico Cross-Border Trade

Due to the accelerating nearshoring trends as described in this report, Mexico was the United States' top trading partner in March 2024, with two-way trade totaling \$68.5 billion, according to the latest data from the Census Bureau (with Canada second at \$61.5B and China third at \$42.7B).⁵⁵ In the first quarter of 2024, trade between Mexico and the U.S. totaled \$200.1 billion, a 1.7% year per year increase.⁵⁴ The top five imports from Mexico to the U.S. in March were passenger vehicles (\$4.2 billion), auto parts (\$3.2 billion), computers (\$2.8 billion), commercial vehicles (\$2.7 billion) and insulated wires/cables (\$1.4 billion), according to Census Bureau data. Port Laredo, Texas, was the # 1 ranked U.S. trade gateway in March of 2024 among the nation's 450 airports, seaports and border crossings.⁵⁴

There are a number of very recent investments by leading U.S. and foreign world-class logistics providers (bringing in foreign direct investment) further substantiating this growth:

- DP World, one of the largest global container terminal operators, has recently launched an intermodal service to transport finished vehicles by rail from Mexico to the United States and Canada. The service is based on loading finished vehicles into containers directly from

⁵⁵ <https://www.freightwaves.com/news/borderlands-mexico-us-mexico-trade-tops-200b-in-first-quarter-of-2024>.

factories in Mexico or from logistics yards close to auto manufacturing hubs. The containers are then transported by commercial trucks to intermodal rail ramps and moved by rail to U.S. and Canadian destinations such as Los Angeles, Chicago, Detroit and Toronto.⁵⁶

- Global supply chain provider Kuehne+Nagel is launching a 363,000 ft² logistics facility in El Paso, TX scheduled to open August 5, 2024, focusing on cross-border trade between El Paso and Juarez, its sister city across the border in Mexico. Juarez, just across the border from El Paso, has around 300 maquiladoras — export factories in Mexico run by foreign companies — employing around 340,000 workers. The facility will feature advanced cross docking capabilities (nothing stays as inventory within the terminal for more than 48hrs) and 54 dock doors.⁵⁷
- In April 2024, the U.S. based leading third-party logistics (3PL), Ryder System, Inc., further opened a new 50,000 ft² logistics facility in El Paso near the Ysleta-Zaragoza International Bridge, which connects El Paso to Juarez.⁵⁶

As a result of these trends, the Port of Eagle Pass, which consists of a rail and vehicle bridge connecting it to Piedras Negras, Mexico has recorded more than \$11.37 billion in trade from January through March 2024, a 22% year-over-year increase compared to the same period in

⁵⁶ <https://www.freightwaves.com/news/dp-world-launches-mexico-to-us-intermodal-rail-service>.

⁵⁷ <https://www.freightwaves.com/news/borderlands-mexico-kuehnenagel-expanding-in-texas-to-meet-rising-manufacturing-demand>.

2023. This trend makes Eagle Pass the fastest-growing major port among the nation's 450 airports, seaports and border crossings, according to Census Bureau data.⁵⁸

As described in Section 3, cross-border cargo moved from Mexico to the U.S. is particularly vulnerable to security threats. The latest statistics as of the writing of this report alarmingly further support this assessment. April of 2024 recorded 153 tractor-trailer thefts in Mexico according to the National Association of Vehicle Tracking and Protection Companies; that's an increase of 7.7% from the same month of 2023.⁵⁹

According to the Mexican Association of Insurance Institutions (AMIS) more than 70% cargo theft cases in Mexico also involve some type of violence.⁵⁵ According to Norma Alicia Rosas, general director of AMIS:

The theft of heavy equipment is highly related to the theft of goods in transit, which not only affects transporters, but also the production chain of multiple companies waiting for supplies or products, and the economy of the communities.

Security challenges are further exacerbated due to migrant issues. Specifically, in 2024 thus far, the cross-border supply chains have been forced to navigate significant shipping delays at the border as the Department of Homeland Security and state governments have responded to spikes in asylum-seeking migrants with closures of ports of entry and new inspection protocols seriously undermining the supply chains' competitiveness. It is for this reason that a broad coalition of roughly 30 U.S. and Mexican trade stakeholders recently urged Presidents Joe Biden and Andres Manuel Lopez Obrador to address migrant issues impacting cross-border trade.⁶⁰

⁵⁸ <https://www.freightwaves.com/news/borderlands-mexico-port-of-eagle-pass-texas-fastest-growing-border-crossing-in-the-u-s>.

⁵⁹ <https://www.freightwaves.com/news/tractor-trailer-thefts-in-mexico-totaled-153-in-april>.

⁶⁰ <https://www.freightwaves.com/news/coalition-urges-biden-obrador-to-address-border-security>.

Specifically, led by the Washington-based Border Trade Alliance, the Texas Association of Business and the Confederation of Industrial Chambers of Mexico (CONCAMIN), the coalition on May 8, 2024 sent a letter to both Presidents asking them to work swiftly to improve the security situation along the border. According to Britton Clarke, President of the Boarder Trade Alliance:

The U.S.-Mexico border is a region of tremendous economic promise, but that's all at risk if our governments fail to ensure that cross-border trade and travel is conducted in a secure, well-managed, properly resourced environment....If the disruptions that have plagued the border region over the past several months are allowed to continue, then we can anticipate that states will act, often with responses that will cause shipping delays and put upward pressure on costs.⁵⁹

Note: In this rapidly growing and challenging trade environment, and despite the leading role of the Ports of Eagle Pass and Laredo, to my knowledge there is no U.S.-Mexico trade (including in the past) that is traveling (or has travelled) up and down the Rio Grande between Mile Markers 275.5 and 610.

6. The Emerging Role of Texas Ports Towards Increased U.S. Supply Chain Resilience

During the height of the Covid-19 pandemic the California ports (Long Beach and Los Angeles being the largest ports of entry in the U.S.) became overwhelmed with multi-week delays in handling and offloading vessels widely publicized. Consequently, many shippers diverted cargo to East Coast and Gulf Coast Ports. This phenomenon (further accentuated by the potential of labor disruptions at these ports in the 2022-2023 period) led to a divergent path for the ports of California and those of Texas. California in 2023 was the second largest outbound state with Texas being No. 1.⁶¹

⁶¹ <https://www.freightwaves.com/news/californias-loss-is-texas-gain#>.

In January of 2023 volumes of loads originating in Texas were 42% higher than they were the same month of 2019, while California's freight demand was 17% lower for the same three-year period. Indicatively, the Port of Houston grew its importing shipment market share from 5% in January 2019 to 7.3% in October 2022 with that value dropping to 6.4% in December of 2022.⁵⁷

The ports of Texas played a significant role during the "black swan" disruption of the pandemic. They further have the potential to play a similar role in the new era ushered by the U.S. industrial policy supporting nearshoring for increased national supply chain resilience and national security. While it will take years for the U.S. to develop the manufacturing infrastructure to substitute Asian manufacturing (at least for critical supply chains), Texas is poised due to its geography and its own thriving industrial base (e.g. industries in defense industrial base, electronics, oil & gas and petrochemicals) to become a prime distribution hub for North American supply chains.

While California's ports will always be attractive for Asian imports across the Pacific, Texas ports have the additional potential to capitalize on increased trade with state members of the European Union as the U.S. is actively supporting "friend shoring" (also known as "allied shoring"). Furthermore, importers increasingly employ a strategy of shipping in geographically dispersed ports (East Coast and Gulf Coast) to reduce their risk exposure (the role of diversification in increasing supply chain resilience has been discussed before)⁶². Being able to divert cargo in case of a major disruption to other ports is critical as it was well demonstrated in the period following the Baltimore bridge collapse on March 26, 2024. Following the collapse, shippers

⁶² Gopal C., Tyndall, G., Partsch W., Iakovou E., *"Breakthrough Supply Chains: How Companies and Nations Can Thrive and Prosper in an Uncertain World"*, McGraw Hill Professional, 2023, <https://www.breakthroughsupplychains.org/>.

employed the FLOW⁶³ data sharing platform (a Biden Administration initiative) to divert containerized freight to the ports of Savannah and New York/New Jersey by ensuring that these ports had enough chassis availability and terminal space, enough available appointments and adequate labor force.⁶⁴

Logistics infrastructure investments that often employ a 50-year planning horizon (as also used by the Army Corps of Engineers) clearly have to take these trends into account. The 50-year horizon appears to be the industry standard as per the expert report of Dr. Thong Zhao.

Note: I was unable to find any studies indicating a 50-year plan, or otherwise, to develop inland ports along the Rio Grande River to make it a highway of commerce between Mile Markers 275.5 and 610.

7. Conclusions and Statement of Expert Opinion

In addition to the analysis that I have provided thus far, I am employing the following definition:

“Commercial navigation” means that “the act of sailing vessels on water” for the purpose of engaging in commercial activity, such as trade or transportation. *See* NAVIGATION, Black’s Law Dictionary (11th ed. 2019).

In the expert reports prepared by the USA’s experts and their depositions there was no discussion about commercial navigation across the Rio Grande. Rather the focus has been on the usage of five types of small vessels across the river: jon boats; shallow draft river vessels; air boats;

⁶³ “A Data-Sharing Approach for Great Supply Chain Visibility”, Eleftherios Iakovou, Chelsea C. White, *Brookings Institution TechStream*, Sept 14, 2022; <https://www.brookings.edu/techstream/a-data-sharing-approach-for-greater-supply-chain-visibility/>.

⁶⁴ <https://www.supplychaindive.com/news/flow-baltimore-bridge-collapse-response-supply-chains-home-depot-ch-robinson-its-logistics/715992/>.

kayaks and canoes (mainly by Mr. MacAllister). While these are important for recreation and border protection activities, their usage by no means constitutes commercial cargo transportation activities that could serve regional, national or international supply chains as described in this document.

Respectfully, neither Messrs. Adrian D. Cortez, Timothy L. MacAllister nor Captain John C. Timmel are, or have claimed to be, maritime logistics, or intermodal logistics and/or supply chain experts. Therefore, I do not believe they are qualified to testify as experts on commercial shipping, intermodal logistics and/or supply chain management.

For the Rio Grande to be commercially navigable it will have to be able to serve the needs of the *Highway of Commerce* (with its intermodal logistics networks serving supply chains) as it has been evolving and as it will be evolving for the years to come. In the sections above I attempted to provide an up-to-date comprehensive narrative for the relevant trends that are truly disruptive as they will be shaping the demands next-gen supply chains that the *Highway of Commerce* will need to attract and serve. These include **supply chain cost efficiency, agility, reliably fast door-to-door transport, resilience, sustainability, and cargo security, all aligned with national security needs.**

In my assessment and knowledge and based on the facts outlined above, the Rio Grande River *currently* is not commercially navigable. We have no conditions in place for intermodal logistics at the Rio Grande River (where cargo could be freely offloaded from barges to trucks, rail at inland ports, or feeder ships at a seaport) as we have for example, across the Mississippi River or throughout Northern and Central Europe, with huge barge traffic flows with seamless cargo

movement among member States of the European Union without cross-border bottlenecks or pressing security hurdles.

Importantly, as of the writing of this report (June 13, 2024) the Rio Grande River has been suffering from an alarming record of drought conditions while still supplying water to six million people in the U.S. and Mexico. The Rio Grande's main reservoirs in Texas (Amistad and Falcon, delineating the River for the purposes of this litigation) are at historically low levels. The repercussions for industry and agriculture are dire. The Texas sugar industry (once the 3rd largest in the U.S.) has collapsed, while sugar cane farmers cannot irrigate their water-intensive crops, further undermining water security for the city of Laredo.⁶⁵

Further in support of this thesis, it is rather telling, that despite the booming U.S.-Mexico cross-border trade, all relevant intermodal logistics networks are being developed bypassing (or overpassing) the river. Currently there are huge investments from startups, third party logistics operators/3PLs and global manufacturers (including interestingly Chinese companies) across the Texas border, all indifferent to the potential of commercial navigation of the Rio Grande River that is simply seen as a natural barrier that has to be simply traversed across by rail or truck.

I have demonstrated in this report that for the establishment of a viable IWT the integration of inland navigation in the intermodal supply chain is an imperative (see also ⁶⁶).

To this effect, any Cost-Benefit Analysis regarding the dredging of the Rio Grande (such as potentially conducted by the Army Corps of Engineers), should attempt to identify the potential

⁶⁵ <https://www.newyorker.com/news/letter-from-the-southwest/the-decline-of-the-río-grande>.

⁶⁶ A. Caris, S. Limburg, C. Macharis, T. Van Lier, and M. Cools. "Integration of inland waterway transport in the intermodal supply chain: a taxonomy of research challenges", *Journal of Transport Geography*, 41 (2014) 126-136.

trade types and supply chain flows (Origin-Destination pairs), current and projected volumes over a 50-year planning horizon that this inland waterway transportation would serve by being embedded within intermodal logistics networks that can operate **seamlessly, efficiently, securely, fast, in a reliably and timely manner**; else trade routes would never use the corridor. *Supply chains and global trade are like water, they will always follow the path of least resistance across the Highway of Commerce.*

On a national level this is fully documented by the World Bank's authoritative Logistics Performance Index (LPI)⁶⁷ (published every 3-4 years) which analyzes the performance of the logistics infrastructure of 150+ countries through six components bifurcated into areas of policy regulation indicating the main inputs to the supply chain (efficiency of customs and border management clearance, quality of trade- and transport-related infrastructure and competence and quality of logistics services) and supply chain outcomes (cost, reliability and time). I have worked with several of the authors of this report when they were assessing the LPI of Greece.

⁶⁷ *Connecting to Compete 2023*, "Trade Logistics in an Uncertain Global Economy: The Logistics Performance Index and Its Indicators", The International Bank for Reconstruction and Development/The World Bank, Washington DC, 2023.

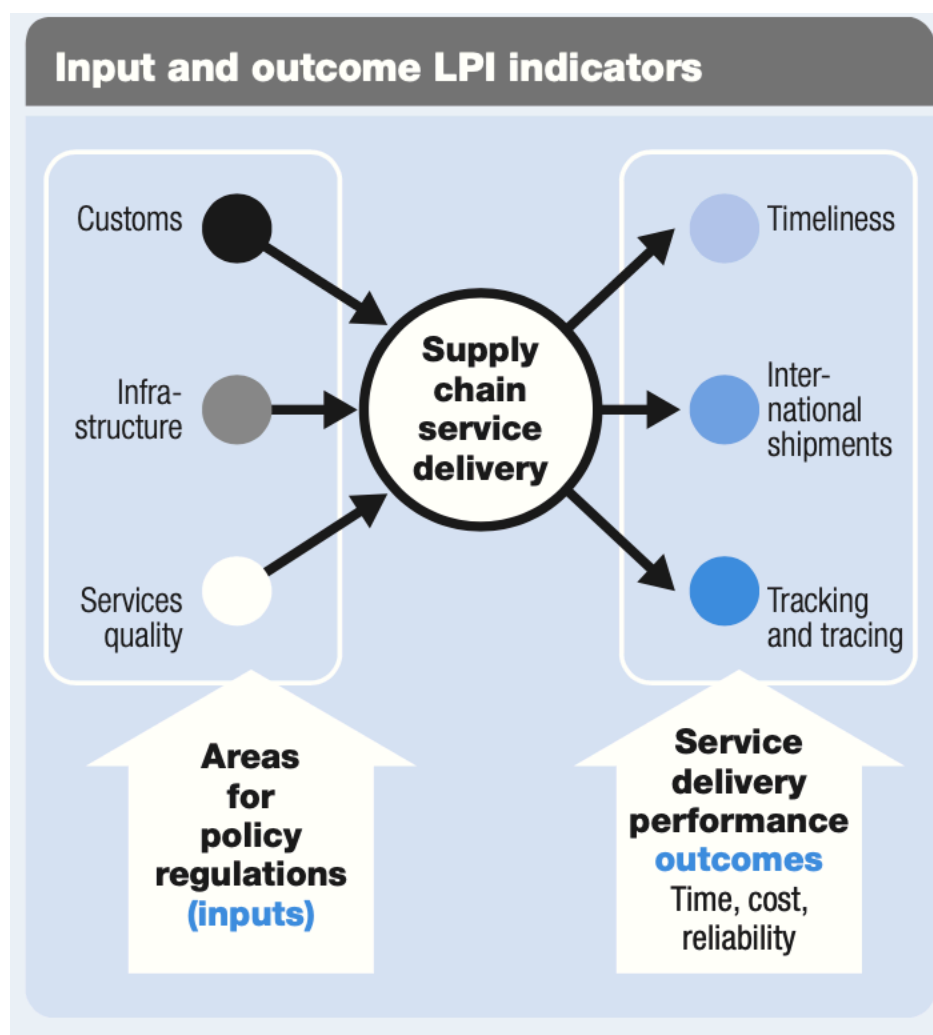


Figure 18: The interplay of Highway of Commerce and the Supply Chain. Source: World Bank⁶⁸

While in this report I have not been asked to conduct such as a Cost-Benefit Analysis I am listing few other macro-issues that need to be considered:

- Environmental and macroeconomic risks and terms.

⁶⁸ *Connecting to Compete 2023*, "Trade Logistics in an Uncertain Global Economy: The Logistics Performance Index and Its Indicators", The International Bank for Reconstruction and Development/The World Bank, Washington DC, 2023

- The solicitation of input from both the private sector (“shippers” who generate the actual demand for intermodal transportation and logistics) but also policymakers (as explained before in this report, regulators today through industrial policy can send potent “demand signals” to supply chains to be restructured and are also shaping the U.S.-Mexico and U.S.-Central America trade relationships and flows). Such an engagement should also lead to the identification of meaningful performance measures (PMs).

Note: To capture IWT corridor performance and inform system improvement (such as the dredging of the Rio Grande), having appropriate PMs is critical (e.g. prioritize intermodal assts, mitigate congestion, etc.). In fact, PMs are mandated to be included in state freight plans in the U.S.⁶⁹

Such thinking and analysis are lacking from any of the USA’s expert reports in this litigation regarding the commercial navigation of the Rio Grande. Based on the analysis that I have provided throughout this report, there are two potential scenarios for successfully establishing an Inland Waterway Transportation (IWT) corridor in the Rio Grande.

Scenario A: Hinterland Connection of the Rio Grande with Ports in the Gulf Coast

The hinterland of a port is the region that uses the port to send goods to or receive goods from overseas ports, and is served by road, rail, and inland waterways (barges). I have discussed in Section 5 the potential of increased flows in the Texas and Gulf Coast ports further strengthening

⁶⁹ Farazi, N. P., Zou, B., Sriraj, P. S., Dirks, L., Lewis, E., Manzanarez, J. P., 2022. “State-level performance measures and database development for inland waterway freight transportation: A US context and a case study”, Research in Transportation Business & Management, 45, p.100866.

national and private sector supply chain resilience and the significance of an IWT being connected with a seaport. A natural step for the commercial navigation of the Rio Grande would then be its seamless connection with Texas ports of the Gulf Coast. However, there are serious impediments for this to materialize as discussed below.

The Rio Grande empties directly into the Gulf of Mexico forming the U.S. Mexico border. The Texas Intercoastal canal does not intersect the Rio Grande. The nearest seaports to the mouth of the Rio Grande are Port Isabel and Port Brownsville which share the same shipping lane and canal to the Gulf of Mexico some 7.5 miles north of the mouth of the Rio Grande – and thus are not connected to the Rio Grande.

Therefore, any freight cargo that is intended to be transshipped to and from the Rio Grande from the nearest port would have to exit the ship channel for Port Brownsville/Isabel, travel south to the U.S. Mexico border and enter the Rio Grande. It must be noted that the mouth of the Rio Grande has at times completely closed due to the limited flow in the river I discussed above. Extensive work would be required to deepen the Rio Grande from its mouth upstream for any commercial navigation to be able to access the river. Upstream of the mouth of the Rio Grande are several rock impoundments created to facilitate water diversion by irrigation districts, the first major one some 8.5 miles downstream of Brownsville, or at the Brownsville Irrigation District. These and other upstream like them will further hinder if not prohibit any commercial navigation.

Note: I have not been able to identify any Cost-Benefit Analysis either by the US Army Corps of Engineers or any other entity regarding such an infrastructure improvement.

Additional challenges for such a scenario stem the steep slope of the Rio Grande, and the constraint on the amount of available water that could be used for commercial navigation purposes, Based on the reports of Mr. Ancil Taylor and Dr. F. Douglas Shields (State of Texas experts), I understand that the open river approach (without a system of locks and dams) alluded to by Messrs. Timothy MacAllister and Adrian Cortez is not technically feasible.⁷⁰

Ancil Taylor in his report assesses the need for 45 dams and locks to materialize the commercial navigation of the Rio Grande. He further ascertains that, “The cost and complexity of creating this navigable waterway exceeds the cost and complexity associated with the most recent expansion of the Panama Canal to cross the isthmus of Central America by a magnitude.” In addition to cost, the number of locks and dams will clearly result in lengthy and highly variable transportation time for vessels navigating the Rio Grande. Shippers would never use such an IWT; they would clearly prefer truck or rail transport modes.

Based on the discussion above, this option does not appear realistic.

Scenario B: Developing Inland Ports throughout the Rio Grande River to connect with the GIWW

In this option inland ports would need to be developed to connect the Rio Grande from RM 610 to the Gulf Intracoastal Waterway. In his expert report, Dr. Tong Zhao⁷¹ has conducted a preliminary Cost-Benefit Analysis for such a case. His scenario assumes a series of locks and dams spanning through the river stretch from RM 610 to the Gulf Coast connecting to the intracoastal waterway, with pump stations for water recycling. Four (4) inland ports are assumed to be constructed at Del Rio, Eagle Pass, Laredo, and McAllen able to handle all the cargo transfer

⁷⁰ Expert Report of Dr. F. D. Shields; Expert report of Ancil Taylor.

⁷¹ Expert Report of Dr. Tong Zhao.

between waterways and rails/highways. His Cost-Benefit Analysis clearly assesses this option as economically non-viable.

Summing Up: In my expert opinion the Rio Grande River: (i) currently is not commercially navigable; and (ii) there are not any technically and economically feasible improvement alternatives to achieve the commercial operation on the Rio Grande that could establish it as a viable Inland Waterway Transportation (IWT) corridor of the *Highway of Commerce*.

8. List of Specific Documents Relied on By Expert:

I relied on many of my own publications and expertise. A few of them are listed in the main document at specific instances for immediate reference. In addition, I drew information from:

1. Bedoya-Maya, F., Shobayo, P., Beckers, J., Van Hassel, E., 2024. "The impact of critical water levels on container inland waterway transport", *Transportation Research Part D: Transport and Environment*, p.104190.
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15. The Decline of the Rio Grande, Rachel Monroe, *The New Yorker*, June 13, 2024.

8. List of Publications Authored in the Prior 10 Years (2014-2024):

▪ Books Published:

1. Iakovou E., “*The Role of Logistics for the Development of Greece for the Years Ahead*”, Economica Publishing Group, 2014 (in Greek).
2. Iakovou E., Bochtis D., Vlachos D., Aidonis D. (eds.), “*Supply Chain Management for Sustainable Food Networks*”, Wiley, 2015.
3. Gopal C., Tyndall, G., Partsch W., Iakovou E., “*Breakthrough Supply Chains: How Companies and Nations Can Thrive and Prosper in an Uncertain World*”, McGraw Hill Professional, 2023, <https://www.breakthroughsupplychains.org/>.

▪ Juried Refereed Journal Articles:

1. Tsolakis N., Keramydas Ch., Toka A., Aidonis D., Iakovou E., 2014. “Agrifood Supply Chain Management: A Comprehensive Hierarchical Decision-making Framework and A Critical Taxonomy”, *Biosystems Engineering*, Vol. 120, pp. 47-64.

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33. Chang Y., Kebli M., Li R., Iakovou E., White C.C. III., 2022. "Misinformation and Disinformation in Modern Warfare"; *Operations Research*, Vol. 70, No. 3, May-June 2022, pp. 1577-1597; DOI: <https://doi.org/10.1287/opre.2021.2253>.
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35. Chrisandina N., Vedant, S., El-Halwagi, M., Pistikopoulos E., Iakovou, E. "Quantitative Methods for Data-Driven Next-Generation Resilience of Energy Systems and Their Supply Chains", 2023. Book Chapter in: *Handbook of Smart Energy Systems*, M. Fathi, E. Zio, P. Pardalos (Eds.) SpringerNature; pp. 409-427. DOI: https://doi.org/10.1007/978-3-030-97940-9_182.

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37. Chrisandina, N. J., Vedant, S., Iakovou, E., Pistikopoulos, E. N., El-Halwagi, M. M., 2023. “Resilience-Aware Muti-Scale Integration of Distributed Energy Systems”, *Computer Aided Chemical Engineering*, Vol. 52, pp. 2953-2958. <https://doi.org/10.1016/B978-0-443-15274-0.50470-4>.
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▪ Refereed White Papers:

1. “How to build more Secure, Resilient, Next-Gen U.S. Supply Chains”, Eleftherios Iakovou, Chelsea C. White III (Georgia Tech), *Brookings Institute TechStream*, Dec 3, 2020; <https://www.brookings.edu/techstream/how-to-build-more-secure-resilient-next-gen-u-s-supply-chains/> (Cited in the 2024 Economic Report of the U.S. President).
2. “Data-Driven Next-Gen Resilient and Sustainable U.S. Supply Chains: At the Front Lines of the Geopolitical New Normal”, *The Takeaway Series Policy Brief*, Mosbacher Institute for Trade, Economics and Public Policy, May 31, 2022; <https://bush.tamu.edu/wp-content/uploads/2022/05/V13-4-Resilient-SCs-Iakovou-Takeaway.pdf>.
3. “A Data-Sharing Approach for Great Supply Chain Visibility”, Eleftherios Iakovou, Chelsea C. White, *Brookings Institution TechStream*, Sept 14, 2022; <https://www.brookings.edu/techstream/a-data-sharing-approach-for-greater-supply-chain-visibility/>.

In addition: 46 publications in Refereed Conference Proceedings.

9. List of Cases Expert Testified in As an Expert the Prior 4 Years.

I have not testified as an expert witness at a deposition or a trial the last four years.

10. Expert Rate Sheet/Hourly Rate

My compensation rate for this case is \$1,500 per hour and \$750 per hour for any travelling involved.

11. Signature Page

The foregoing Expert Report captures Dr. Iakovou's opinions based on his experience, his relevant research, the facts, reports, depositions in this matter, and interactions with others. The conclusions and opinions are compiled and submitted in this report. As discovery is ongoing, and / or additional information relevant to this case becomes available, Dr. Iakovou reserves his right to amend or supplement the analysis and expert opinions herein.



Date: June 14, 2024

Eleftherios Iakovou, Ph.D.
Professor and Holder of the Harvey Hubbell Professorship of Industrial Distribution
Texas A&M University

REPORT SUPPLEMENTS

Exhibit A – Dr. Iakovou's CV (52 pages)

EXHIBIT A

CURRICULUM VITAE

Eleftherios Iakovou, Ph.D., P.E.

Professor & Holder of the Harvey Hubbell Professorship
Department of Engineering Technology and Industrial Distribution
Department of Multidisciplinary Engineering (Courtesy Appointment)
Professor of Supply Chain Management (Courtesy Appointment)
Mosbacher Institute of Trade, Economics and Public Policy,
Bush School of Government and Public Service
Texas A&M University

Director, Manufacturing and Logistics Innovation Initiatives,
Texas A&M Engineering Experiment Station (TEES)
Associate Director, Resilience and Sustainability of Integrated Energy and Manufacturing Supply Chains
Texas A&M Energy Institute

Director, Supply Chain Management, SecureAmerica Institute, Texas A&M University System
Co-Director, Global Value Chains Program
Mosbacher Institute of Trade, Economics and Public Policy,
Bush School of Government and Public Service
Associate Director, Supply Chain Management and Applied Operations Research
Texas A&M Center for Applied Technology (TCAT)

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Home Address: [REDACTED]

E-mail: eiakovou@tamu.edu

Office Telephone: [REDACTED]

Personal Telephone: [REDACTED]

Higher Education

▪ Institutional Training

- Ph.D., School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY, January 1992.
- M.S., School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY, May 1990.
- 5-year Diploma in Mechanical Engineering, Aristotle University of Thessaloniki, Thessaloniki, Greece, June 1987.

▪ Certification, Licensure

- Licensed Professional Engineer, Technical Chamber of Greece, since 1998.

Professional Experience

▪ Academic:

- 2021-Pres. **Associate Director** for Resilience and Sustainability of Integrated Energy and Manufacturing Supply Chains, Texas A&M Energy Institute.
- 2020-Pres. **Professor & Holder of the Harvey Hubbell Professorship**, Industrial Distribution Program, ETID, Texas A&M University, College Station, TX.
- 2020-Pres. **Director**, Supply Chain Management, SecureAmerica Institute, Texas A&M University System.
- 2020-Pres. **Co-Director**, Global Value Chains Program, Mosbacher Institute of Trade, Economics and Public Policy, Bush School of Government and Public Service, Texas A&M University, College Station, TX.
- 2023-Pres. **Professor** (Courtesy Appointment), Department of Multidisciplinary Engineering, Texas A&M University, College Station, TX.
- 2020-2023 **Professor** (Courtesy Appointment), J. Mike Walker '66 Department of Mechanical Engineering, Texas A&M University, College Station, TX.
- 2017-Pres. **Associate Director**, Supply Chain Management and Applied Operations Research, Texas A&M Center of Applied Technology (TCAT).
- 2015-Pres. **Director**, Manufacturing and Logistics Innovation Initiatives, Texas A&M Engineering Experiment Station (TEES).
- 2015-2020 **Professor & Holder of a TEES Research Professorship**, ETID, Texas A&M University, College Station, TX.
- 2018-2019 **Director**, Global Trade and Supply Chain Management, Center for Cross-Border Threat Screening and Supply Chain Defense, DHS Center of Excellence, Texas A&M University System.
- 2007-2015 **Professor**, School of Mechanical Engineering, Aristotle University of Thessaloniki, Greece.
 - Sep 2013-Aug 2015 **Head**, School of Mechanical Engineering.
 - Sep 2007-Aug 2013 **Head**, Department of Industrial Management.

- Sep 2002-Aug 2015 **Director**, Laboratory of Logistics and Supply Chain Management.
- 2002-2007 **Associate Professor** (with Tenure), School of Mechanical Engineering and **Director**, Laboratory of Logistics and Supply Chain Management, Aristotle University of Thessaloniki, Greece.
- 1998-2002 **Associate Professor** (with Tenure), Department of Industrial Engineering, University of Miami, Coral Gables, FL.
- 2000-2002 **Founder & Director**, Anthony Burns Center for Advanced Supply Chain Management (CASCMS), University of Miami, Coral Gables, FL.
- 2000-2002 **Founder & Director**, Perry Ellis International Logistics Research Institute, University of Miami, Coral Gables, FL.
- 1994-1998 **Founding Member** of the Center and **Lead** for the Optimization of Maritime Transportation, Statistical Analysis & Risk, Ocean Pollution Research Center (OPRC), University of Miami, Coral Gables, FL.
- 1992-1998 **Assistant Professor**, Department of Industrial Engineering, University of Miami, Coral Gables, FL.
- Sep-Dec 1998 **Visiting Assistant Professor**, Athens University of Economics and Business, Greece.
- May-Aug 1992 **Visiting Assistant Professor**, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY.
- 1990-1992 **Research Assistant**, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY.
- 1987-1990 **Teaching and Research Graduate Assistant**, School of Operations Research and Industrial Engineering, Cornell University, Ithaca, NY.
- Non-Academic:

2005-2016 **President**, Greek Association of Supply Chain Management, Greece.

2010-2013 **Chairman, Board of Directors**, Jul 2010-Jul 2013 & **Chief Executive Officer (CEO)**, Nov 2012-Jul 2013. Alexandrian Innovation Zone S.A., Greece.

Publications

- Books and Monographs Published:
 4. Iakovou E., “*Balancing of the Production Lines for the Hellenic Automotive Industry*”, Diploma Thesis, Aristotle University of Thessaloniki, Polytechnic School, Thessaloniki, Greece, 1987.
 5. Iakovou E., “*A Hierarchical Approach to Machine Batching, Loading, and Tool Allocation Problems*”, Ph.D. Dissertation, Cornell University, Ithaca, NY, 1990.
 6. Iakovou, E., “*Operations Research I*”, Textbook, Department of Mechanical Engineering, Aristotle University of Thessaloniki, Greece, 2005.
 7. Iakovou, E., “*Inventory Management and Production Planning*”, Textbook, Department of Mechanical Engineering, Aristotle University of Thessaloniki, Greece, 2007.
 8. Iakovou, E., “*Supply Chain Management*”, Textbook, Department of Mechanical Engineering, Aristotle University of Thessaloniki, Greece, 2009.

9. Iakovou E., “*The Role of Logistics for the Development of Greece for the Years Ahead*”, Economika Publishing Group, 2014 (in Greek).
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 11. Gopal C., Tyndall, G., Partsch W., Iakovou E., “*Breakthrough Supply Chains: How Companies and Nations Can Thrive and Prosper in an Uncertain World*”, McGraw Hill Professional, 2023, <https://www.breakthroughsupplychains.org>.
- Juried Refereed Journal Articles:
 - *Refereed Articles in Journals*
 16. Iakovou E., Douligieris C., Korde A., 1994. “A Synthesis of Decision Models for Analysis, Assessment, and Contingency Planning for Oil-Spill Incidents”, *Omega, The International Journal of Management Science*, Vol. 22, No. 5, pp. 457-470.
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 18. Koulamas C., Iakovou E., 1995. “Machining Economics with Machine Interference Considerations”, *International Journal of Production Research*, Vol. 33, No. 1, pp. 71-78.
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27. Iakovou, E., White, C., “The Next-Generation U.S. Industrial Base and National Security”, Industry Studies Association Annual Conference, Jun 2-4, 2021.
28. Chrisandina, N. J., Vedant, S., Iakovou, E., Pistikopoulos, E. N., El-Halwagi, M. M., “A Multiscale Integrative Framework for the Design of Cost-Competitive Resilient and Sustainable Distributed Energy Systems”, INFORMS Annual Meeting, Oct 16-19, 2022, Indianapolis, IN.
29. Chrisandina, N. J., Vedant, S., Iakovou, E., Pistikopoulos, E. N., El-Halwagi, M. M., “Multiscale Integration for Sustainable and Resilient Distributed Energy Systems (DESS)”, AIChE Annual Meeting, Nov 13-18, 2022, Phoenix, AZ.
30. Chrisandina, N. J., Vedant, S., Iakovou, E., Pistikopoulos, E. N., El-Halwagi, M. M., “Multiscale Integration for Resilient Energy Systems Under Disruption”, AIChE Annual Meeting, Nov 5-10, 2023, Orlando, FL.
31. Vedant, S., Chrisandina, N. J., El-Halwagi, M. M., Iakovou, E., Pistikopoulos, E. “A Quantitative Framework Towards Managing Risks and Disruptions in Energy and Manufacturing Supply Chains”, AIChE Annual Meeting, Nov 5-10, 2023, Orlando, FL.
32. Wang, K., Liu, Z., White, C.C., Wang, B., Iakovou, E. “Improved Medical Equipment Supply Chain Resilience Against Epidemic Outbreaks Using Automation”, Industry Studies Association Annual Conference, Jun 13-15, 2024, Sacramento, CA.

33. Chrisandina, N. J., Deshpande, A. A., Al-Fadhli, F. M., Iakovou, E., Pistikopoulos, E., El-Halwagi, M. M. “Integration of Flexibility and Resilience in the Design of Co-located Water and Power Systems”, AIChE Annual Meeting, Oct 27-31, 2024, San Diego, CA.
34. Vedant, S., Chrisandina, N. J., Nkoutche, C., Iseri, F., Iseri, H., El-Halwagi, M. M., Iakovou, E., Pistikopoulos, E. “Towards a Multi-Stage Stochastic Optimization Approach for Resilient Supply Chain Network Design and Operations”, AIChE Annual Meeting, Oct 27-31, 2024, San Diego, CA.
35. Iseri, H., Iseri, F., Iakovou, E., Pistikopoulos, E. “A Multi-Objective Decision-Making Framework for Renewable Energy Transportation”, AIChE Annual Meeting, Oct 27-31, 2024, San Diego, CA.
36. Iseri, F., Iseri, H., Chrisandina, N. J., Vedant, S., Iakovou, E., Pistikopoulos, E. “Optimizing the Reverse Supply Chain Network for Photovoltaic Panels under Uncertainty”, AIChE Annual Meeting, Oct 27-31, 2024, San Diego, CA.

- *Selected Technical Reports:*

1. Iakovou E., “Optimal Sequencing of Operations for Numerically Controlled Machines”, Technical Report, Cornell University, Ithaca, New York, Aug 1990.
2. Iakovou E., “Batching, Loading, and Tool Allocation Problems in Flexible Manufacturing Systems”, Technical Report, Cornell University, Ithaca, New York, Jan 1992.

- *Columnist in Periodical Magazines:*

1. Columnist (2005-2015) and Scientific Advisor (2005-2011) for the monthly trade magazine: *Logistics & Management*, Athens, Greece.
2. Columnist for the following newspapers: *Aggelioforos*, *Makedonia*, *Kerdos*, *Hmerisia*, *Express*, *Naftemporiki*, *Ependytis* and the *Supply Chain & Logistics* Monthly Magazine, all in Greece.

- *OpEds:*

54. Opportunities amid tragedy: Insights for increased resilience to transnational trade and supply chain management disrupted by Hurricane Harvey”, Ioannis Kakadiaris, Eleftherios Iakovou, *Houston Chronicle*, Oct 26, 2017.
55. “Human trafficking: Harvey’s impact goes beyond weather damage”, Ioannis Kakadiaris, Luis Torres, Eleftherios Iakovou, *Houston Chronicle*, Mar 23, 2018.
56. “The Role of the Supply Chain in Food Security”, Eleftherios Iakovou, *Innovators Podcast*, Harris Search Associates, Nov 8, 2019; (<https://www.youtube.com/watch?v=dAWpgkON2ps>).
57. “How to build more Secure, Resilient, Next-Gen U.S. Supply Chains”, Eleftherios Iakovou, Chelsea C. White III (Georgia Tech), *Brookings Institute TechStream*, Dec 3, 2020; <https://www.brookings.edu/techstream/how-to-build-more-secure-resilient-next-gen-u-s-supply-chains/> (Refereed publication; **Cited in the 2024 Economic Report of the U.S. President**).
58. “The Impact of Covid-19 on Global Supply Chains”, Eleftherios Iakovou, *Half an Hour with Economia*, Mar 2, 2021 (in Greek, <https://www.youtube.com/watch?v=IngE1S6SJ6I&t=180s>).
59. “Preparing for the Unpredictable”, Eleftherios Iakovou, *Texas A&M Today*, Apr 7, 2021.
60. “HVAC Companies Battle Extreme Temperatures and Supply Shortages”, Eleftherios Iakovou, *KBTX Channel 3 News*, College Station, TX, Jun 18, 2021.

61. “Why U.S. Supply Chain Failed During the Pandemic and How to Make it Resilient”, *Scholar’s Circle Syndicated Radio Show/Podcast*, Dec. 5, 2021; <https://www.youtube.com/watch?v=uJYG7WAc2Xo>.
62. “Data-Driven Framework to Build More Resilient Supply Chains”, Eleftherios Iakovou, *KBTX News*, College Station, TX, Dec 10, 2021; <https://www.kbtx.com/2021/12/10/texas-am-researcher-developing-data-driven-framework-build-more-resilient-supply-chains/>.
63. “Data-Driven Next-Gen Resilient and Sustainable U.S. Supply Chains: At the Front Lines of the Geopolitical New Normal”, *The Takeaway Series Policy Brief*, Mosbacher Institute for Trade, Economics and Public Policy, May 31, 2022; https://bush.tamu.edu/wp-content/uploads/2022/05/V13-4_Resilient_SCs_Iakovou_Takeaway.pdf
64. “A Data-Sharing Approach for Great Supply Chain Visibility”, Eleftherios Iakovou, Chelsea C. White, *Brookings Institution TechStream*, Sept 14, 2022; <https://www.brookings.edu/techstream/a-data-sharing-approach-for-greater-supply-chain-visibility/> (Refereed publication).
65. “Lost Packages from Retailers and the Process of Supply Chain Management”, KCEN-TV Channel 6 News, Temple, TX, Sept 8. 2023; <https://www.kcentv.com/article/news/verify/who-is-responsible-for-a-lost-package/500-b1311d3a-227e-4401-9a00-c49474dd4728> .
66. “Impact of the Baltimore Bridge Collapse on U.S. Supply Chains”, KBTX Channel 3 News, College Station, TX, Mar 26, 2024; <https://www.kbtx.com/2024/03/26/focus-four-logistics-expert-fallout-baltimore-bridge-collapse/>.

Professional

▪ Funded Research Performed:

1. “Robotics and Automation Decision Framework for Agility and Resilience (RADAR)”, Advanced Robotics for Manufacturing Institute (ARM)/NIST Office of Advanced Manufacturing (OAM), RACER Grant Program, Mar 2022-Dec 2024, **\$4,090,558, Principal Investigator**; with total funding from NIST at **\$5,000,000**.
2. “Securing Critical Material Supply Chains by Enabling Photovoltaic Circularity (SOLAR)”, NSF Convergence Accelerator Program Planning Grant, Jan 2023-Dec 2023; Subcontract from Battelle to Texas A&M, **\$135,000, Principal Investigator**; with total funding by NSF at **\$750,000**.
3. “Securing Critical Material Supply Chains by Enabling Photovoltaic Circularity (SOLAR)”, NSF Convergence Accelerator Program Phase II, Feb 2024-Jan 2027; Subcontract from Battelle to Texas A&M, **\$800,000, Principal Investigator**; with total funding by NSF at **\$5,000,000**.
4. “SMART-RECLAIM: Scalable, Modular and Adaptable Reclamation Technology for Hydrofluorocarbon Refrigerant Enhancement, Circular Logistics, and Intelligent Toll Manufacturing”, The Environmental Protection Agency (EPA), **\$1,500,000** for 5 years (awarded May 17, 2024); **Co-Principal Investigator** (with PI Dr. Faruque Hasan).
5. “Texas Division of Emergency Management Administrative Needs Assessment”, Texas Division of Emergency Management (TDEM), \$750,000, Mar 15, 2021-May 14, 2021; **\$35,115** my share as **Co-Principal Investigator**.
6. “Data-Driven Design for the Security, Agility and Next Generation Resilience of Manufacturing Supply Chains”, SecureAmerica Institute, **\$50,000**, Jan 1, 2021-Dec 31, 2021, **Principal Investigator**.

7. “National Imperative for Industrial Skills Prototype”, Industrial Base Analysis and Sustainment (IBAS), U.S. Department of Defense, \$450,000 (Phase I), Aug 1, 2020-Jul 31, 2021; **\$66,962**, my share as **Co-Principal Investigator**.
8. “National Imperative for Industrial Skills Prototype”, Industrial Base Analysis and Sustainment (IBAS), U.S. Department of Defense, \$4.6M (Phase II), Aug 1, 2021-Aug 6, 2023; **\$335,000**, my share as **Co-Principal Investigator**.
9. “Thinking Inside the Box: A Circular Economy Approach To the 30K Vertical House”, T3 Project, \$32,000, Jan 1, 2020-Dec 31, 2022; **\$10,667**, my share as **Co-Principal Investigator** (with Drs. Ahmed K. Ali and Michael J. O’Brien; College of Architecture).
10. “Transforming Trade and Ensuring Global Supply Chain Security with Blockchain and Smart Contracts”, Borders Trade and Immigration Institute, DHS Center of Excellence, \$300,000, Dec 2018-Dec 2019; **\$101,152** my share as **Co-Principal Investigator** (with Dr. Larry Shi, University of Houston).
11. “Disrupting Exploitation and Trafficking Labor Supply Networks in Post-Harvey Rebuild: An Evidence-Based Multi-Agent Stochastic Decision-Making Framework”, NSF EAGER, \$299,943, Sept 2018-Aug 2020; **\$85,503**, my share as **Co-Principal Investigator** (with Dr. Matt Kammer-Kerwick, UT Austin).
12. Center for Cross-Border Threat Screening and Supply Chain Defense, CBTS COE, **\$57,841.26**, Oct 1, 2018-Dec 31, 2019, **Principal Investigator**.
13. “Secure and Transparent Cargo Supply Chain: Enabling Chain-of-Custody with Economical and Privacy Respecting Biometrics, and Blockchain Technology”, Borders Trade and Immigration Institute, DHS Center of Excellence, **\$80,000**, Sept 2017-Aug 2019, **Principal Investigator**.
14. “Design of a Supply Chain for NuScale’s Balance of Plant (BOP)”, Funded by FLUOR, \$37,500, Nov 2016-May 2017, **\$12,500**, my share as **Co-Principal Investigator**.
15. “Innovation Capacity Building by Strengthening Expertise and Research in the Design, Planning and Operations of Green Agrifood Supply Chains”, (European Center of Excellence); Funded by the FP7-REGPOT program of the European Commission, **\$1,833,924**, Oct 2012-Mar 2016, **Principal Investigator**.
16. “Strategic Supply Chain Design and Best Inventory Management Practices”, ZANAE (zanae.gr/en), Jan 2015-Jul 2015, **Principal Investigator**.
17. “Development of Forecasting Methods for Estimating the Yield of Clingstone Peaches per Area and Variety”, Funded by Greek Canning Peach Association, Jan-May 2014, **Principal Investigator**.
18. “Feasibility Study for the Establishment of the Dual Vocational Education and Training System in Schools and Enterprises in Greece in the Transport and Logistics Sectors” in cooperation with the EffizienzCluster Management GmbH, Germany; Funded by the Federal Institute for Vocational Education and Training (BIBB), Dec 2013-Mar 2014, **Principal Investigator**.
19. “Hellenic Civil Unmanned Aerial Vehicle – HCUAV”, Within the Framework of the program SYNERGASIA, General Secretariat of Research and Technology, Jun 2013- Jun 2015, **Co-Investigator**, (Scientific Coordinator Dr. K. Yakinthos).
20. “Strategic Master Plan for Port Network Development of Municipality of Volvi”, Funded by The Municipality of Volvi, May 2012-Sep 2012, **Principal Investigator**.
21. “Feasibility Study for initiating the Shipping Line Igoumenitsa - Toulon (France)”, Funded by the Igoumenitsa Port Authority S.A., Feb 2011-May 2011, **Principal Investigator**.

22. "Development of the Strategic Plan for the Metropolitan Mass Transit Organization of Thessaloniki", Funded by EUROACTION AE, Jan 2011-Jun 2011, **Principal Investigator**.
23. "Support of Research Activities of Laboratory of Statistics and Quantitative Analysis Methods", Mar 2010-Dec 2011, **Principal Investigator**.
24. "Decision Making Models for Logistics and Supply Chain Management of Renewable Energy Sources: Application for the Case of Energetic Utilization of Biomass", Ministry of Education, Life-long Learning and Religious Affairs, Hrakleitos II, 2010-2013, **Principal Investigator**.
25. "Optimal Allocation of Points of Sales for the "MACEDONIA" Press Agency", Funded by the "MACEDONIA" Press Agency, 2010-2011, **Principal Investigator**.
26. "Crisis Management on the District of Tempi - Master Plan for the Municipalities of Anatolikos Olympos, Kato Olympos and Evrimenes", Funded by The Municipalities of Anatolikos Olympos, Kato Olympos and Evrimenes, 2010-2011, **Principal Investigator**.
27. "Identification and Analysis of Bottlenecks for Contemporary Globalized Supply Chains", Funded by TEXPO A.E., 2009-2010, **Principal Investigator**.
28. "Feasibility Study for the Short-Shipping Connection between the Cities of Kavala and Alexandria, Egypt, Prefectures of Kavala, Drama and Xanthi, 2009, **Principal Investigator**.
29. "Design of a National Network for Stem Cell Banks in Greece", Haematological Society of Greece, Oct 2008-Dec 2008, **Principal Investigator**.
30. "Feasibility Study for the Decentralization of Services of the Aristotle University of Thessaloniki to its Engineering School", Office of the Dean, School of Engineering, Aristotle University of Thessaloniki, Sep 2008-Dec 2008, **Principal Investigator**.
31. "Maturation of Studies and Processes for Attracting Investors to the International Freight Village of Thesprotia, Municipality of Paramythia", Funded by IMPETUS Engineers S.A., Jul 2007-Jul 2008, **Principal Investigator**.
32. "Information Management System for the Construction Materials at the End of their Useful Life", Funded by the Greek General Secretariat for Research and Technology, Program for Enhancing Research Workforce (PENED) 2003, Jul 2005- Jun 2008, **Co-Investigator**.
33. "Optimal Use of Biomass from Olive Oils", Funded by the Greek General Secretariat for Research and Technology, Program for Enhancing Research Workforce (PENED) 2003, Jul 2005- Jun 2008, **Co-Investigator**.
34. "Diffusion of Supply Chain Management Techniques", Funded by Technoekdotiki S.A., Apr 2005-Jun 2007, **Principal Investigator**.
35. "Strategic Gastronomic Tourism Planning for the Region of Central Macedonia", Mar-Nov 2005, **Principal Investigator**.
36. "Optimal Management of Industrial Products at the End of their Useful Life", Pythagoras I, Greek Ministry of National Education and Religious Affairs, Mar 2004-2008, **Co-Investigator**.
37. "Impact Assessment / On-Board Diagnostic (OBD) Systems for Passenger Cars", Enterprise Directorate, European Commission, Dec 2003-Jun 2004, **Co-Investigator**.
38. "Impact assessment / Package of New Requirements Relating to the Emissions from Two and Three-Wheel Motor Vehicles", Enterprise Directorate, European Commission, Dec 2003-Jun 2004, **Co-Investigator**.
39. "Anthony Burns Center for Advanced Supply Chain Management", Funded by Ryder Dedicated Logistics Inc., Jan 2001-Jun 2002, **Principal Investigator**.

40. "A Systems Analysis of the Supply Chain and Reengineering of the Distribution Center for Perry Ellis International Inc." Funded by Perry Ellis International. Jan 2001-Dec 2001, **Principal Investigator.**
41. "Reengineering of the University of Miami's Auxiliary Laundry Services". Funded by the University of Miami, Department of Auxiliary Services. Jan 2001-May 2001, **Principal Investigator.**
42. "Reengineering the Primary Care Service at the West Palm Beach VA Medical Center". Funded by the Department of Veteran Affairs, West Palm Beach Medical Center. Jun 2000-Dec 2000, **Principal Investigator.**
43. "A Continuous Improvement Follow-up for the Update of the Coral Gables Parking and Transportation System". Funded by the University of Miami, Parking and Transportation Services. Nov 1999-Dec 2000, **Principal Investigator.**
44. "Evaluation and Optimization of the University of Miami's Shuttle Service". Funded by the University of Miami, Nov 1997-May 1998, **Principal Investigator.**
45. "Determinants of VA and Non-VA Health Care Use among Elderly Veterans". Funded by the Department of Veterans Affairs Investigator Initiated Research Program. Apr 1998-Mar 2000, **Co-Investigator.**
46. "Optimal Planning/ Scheduling of Activities of Daily Living for the Elderly". Funded by the Miami Center on Human Factors and Aging Research, Aug 1996-Jun 1997, **Principal Investigator.**
47. "Study of Gulf Coast Oil Spill Contingency Plans with Respect to Remediation and Restoration". Funded by the National Sea Grants Office, NOAA, Jul 1996-Jul 1997, **Co-Principal Investigator.**
48. "Oil Spill Management Information Systems". Funded by the National Oceanic and Atmospheric Administration's (NOAA) Coastal Ocean Program, Oct 1995-Jun 1997, **Co-Principal Investigator.**
49. "Human Factors Analysis of Human Reliability in Marine Systems". Funded by the United States Department of Transportation, Jun 1995-Dec 1996, **Principal Investigator.**
50. "An Adaptive Optimization Framework in Intelligent Manufacturing and Adaptive Analysis of Oil Spill Statistics". Research Council, University of Miami, May-Aug 1995, **Principal Investigator.**
51. "Optimization of the User Interface for Transportation Decision Support Systems". Funded by Ryder Dedicated Logistics, Inc., Dec 1994-May 1995, **Principal Investigator.**
52. "Risk Assessment Model Formulation". Funded by the United States Coast Guard, Sep 1994-Jun 1996, **Co-Principal Investigator.**
53. "Development of a National Marine Oil Transportation Model". Funded by the United States Coast Guard, May 1995-Jun 1996, **Principal Investigator.**
54. "Development of a National Marine Oil Transportation Model". Funded by the United States Coast Guard, Sep 1994-May 1995, **Co-Principal Investigator.**
55. "Oil Spill and Transportation Database Acquisition". Funded by the United States Coast Guard, Sep 1994-Jun 1996, **Co-Principal Investigator.**
56. "An Adaptive Decision Support System for Oil Spill Countermeasures". Funded by the United States Coast Guard, Sep 1994-Jun 1996, **Co-Principal Investigator.**
57. "Design of Prototype South Florida Oil Spill Management System". Funded by the United States Coast Guard, Oct 1993-Apr 1996, **Co-Principal Investigator.**

58. "Health Related Quality of Life, Functional Status and Health Service Use Among South Florida's Elderly". Funded by the National Institute of Aging's Miami Center on Human Factors and Aging Research, Feb 1995-Feb 1996, **Co- Investigator**.
59. "A Simulation Based Approach to Group Preventive Maintenance". Research Council, University of Miami, 1993, **Principal Investigator**.
60. "Age Differences in the Performance of Computer Based Work". Funded by the National Institute on Health, National Institute on Aging, 1993-1995 (Project's total duration: 1993-1998), **Co-Investigator**.
61. "Building Manufacturing Strength: Initiatives in Research Curriculum and Laboratory Development, Part 11". Funded by the Society of Manufacturing Engineers, Jun 1993, **Co-Principal Investigator**.
62. "Decision Models for Scheduling and Tool Management in Flexible Manufacturing Systems". Research Council, University of Miami, May-Aug 1993, **Principal Investigator**.
63. "Building Manufacturing Strength: Initiatives in Research Curriculum and Laboratory Development, Part I". Funded by the Society of Manufacturing Engineers, Jun 1992, **Co-Investigator**.
64. "Batching, Loading and Tool Allocation for Flexible Manufacturing Systems". Research Council, University of Miami, May 1992, **Principal Investigator**.

▪ Editorial Responsibilities:

- *Maritime Economics & Logistics (MEL)*, **Associate Editor for the Americas**; 2019-Present.
- *International Journal of Logistics Economics and Globalization (IJLEG)*, **Editorial Board Member**; 2014- Present.
- *Maritime Economics & Logistics (MEL)*, **Editorial Board**; 2016-2019.
- *Global Journal of Environmental Science and Technology*, Editorial Board, 2010
- *International Journal of Emergency Management*, Editorial Board, 2000-2010
- *International Journal of Logistics Systems Management*, Guest Editor, 2005-2006
- Refereed papers for the following journals:
 1. *Additive Manufacturing*
 2. *Asia-Pacific Journal of Operational Research*
 3. *ASME Transactions, Journal of Manufacturing and Science Engineering*
 4. *Computers and Industrial Engineering*
 5. *Computers and Operations Research*
 6. *Computer*
 7. *Decision Support Systems*
 8. *Electronic Markets: The International Journal on Networked Business*
 9. *Environmental Engineering and Management Journal*
 10. *Environmental Science & Technology*
 11. *European Journal of Operational Research*

12. *IIE Transactions*
13. *International Journal of Emergency Management*
14. *International Journal of Industrial and Systems Engineering*
15. *International Journal of Information Technology and Decision Making*
16. *International Journal of Integrated Supply Management*
17. *International Journal of Logistics, Economics and Globalization*
18. *International Journal of Production Economics*
19. *International Journal of Production Research (IJPR)*
20. *International Journal of Systems Science*
21. *Journal of Environmental Informatics*
22. *Journal of Humanitarian Logistics and Supply Chain Management*
23. *Journal of Intelligent Manufacturing*
24. *Journal of Systems Science and Systems Engineering*
25. *Management Science*
26. *Maritimes Economics & Logistics*
27. *Naval Research Logistics*
28. *Omega*
29. *Operations Research: An International Journal*
30. *Operations Research Letters*
31. *Production Planning and Control*
32. *Resources, Conservation & Recycling*
33. *Transportation Business & Management*
34. *Transportation Research Part E: Logistics and Transportation Review*
35. *Transportation Science*
36. *Waste Management*
37. *Wiley (reviewer of proposed Books)*

■ Professional and Honorary Organizations:

● *Memberships:*

- American Institute of Chemical Engineers (AIChE), 2023-Present.
- Council of Supply Chain Management Professionals (CSCMP), 2007 - Present.
- The Institute for Operations Research and the Management Sciences (INFORMS), 1998 - Present.
- Industry Studies Association, Sept 2020-Present.
- The Operational Research Society, UK, 2014-2020.

- Institute of Industrial Engineers (IIE), 1992-2002.
- IIE Greater Miami Chapter, Director, 1996-1998.
- Hellenic Operational Research Society (HELORS), 1989-Present.
- Technical Chamber of Greece (TCG), 1998-Present.
- *Positions Held:*
 - National Science Foundation, NSF Engines Type-2 Review Panelist, May 23-25, 2023.
 - Judge/Evaluator, Supply Chain Hackathon, U.S. Air Force Manufacturing Olympics (AMO), Aug-Dec 2020.
 - Supply Chain and Logistics Lead, Texas A&M Emergency Management Advisory Group (TEMAG), Jan 2020-Present.
 - Co-Director, Global Value Chains Program, Mosbacher Institute for Trade, Economics, and Public Policy, Bush School of Government and Public Service, Fall 2020-Present.
 - Advisory Board Member, “PI and Blockchain Applied in the Integration of TEN-T into a Global Trade Logistics Network” (PLANET); European Union-funded consortium, Summer 2020-Present.
 - Director, Cross-Border Trade and Supply Chain Management, Cross-Border Threat Screening and Supply Chain Defense (CBTS), a DHS Science and Technology (S&T) Center of Excellence, Texas A&M University System, Oct 2018-Dec 2019.
 - Internal Steering Committee Member, Novel Operational Methods/Supply Chain Management Thrust Lead; Cross-Border Threat Screening and Supply Chain Defense (CBTS), a DHS S&T Center of Excellence, Texas A&M University, Oct 2018-Dec 2019.
 - Associate Director of Transnational Trade and Supply Chain Management, Borders, Trade and Immigration Institute, (BTI), a DHS S&T Center of Excellence, Jul 2017-Jun 2018.
 - Jury Member; 7th MEL-Palgrave-MacMillan Prize for Best PhD Thesis in Maritime Economics & Logistics (2016-2019), Genoa Port Authority, Genoa, Italy, Jun 29, 2019.
 - Awards Nomination Committee Member; Onassis Prizes on Finance, International Trade and Shipping; Cass Business School, City, University of London, London, UK, Sep 24-25, 2018.
 - National Science Foundation (NSF) Proposals Review Panelist; Operations Engineering (ENG) Program, NSF HQ, Alexandria, VA, Mar 5-6, 2018.
 - Jury Member; 6th MEL-Palgrave-MacMillan Prize for Best PhD Thesis in Maritime Economics & Logistics (2013-2016), Hamburg, Germany, Aug 2-16, 2016.
 - Judge/Evaluator; Evaluation Committee of 20th Student Competition on “Competition and Greek Economy, Economia Group, Athens, Greece, Apr 2014.
 - Judge/Evaluator; Evaluation Committee of the Hellenic Institute of Logistics Management (ILME) for the Greek Logistics Awards 2014, under the auspices of European Logistics Association (ELA), Athens, Greece, Mar 2014.
 - President, Greek Association of Supply Chain Management (GASCM), Nov 2005 – Jan 2016.
 - Vice President, Greek Association of Supply Chain Management, Dec 2003-Nov 2005.

- Reviewer of Proposals, the Hellenic General Secretariat of Research and Technology (in Athens, Greece), 2007-2015.
- Advisory Committee Member for the 4th Planning Period 2007-2013, Region of Central Macedonia, Member, 2005-2007.
- Institute of International Co-operation of Greek Scientists (IDISIEEP), World Council of Hellenes Abroad (SAE), Member of Board of Directors, 2004-2005.
- Committee of Industry, Technology Networks, Materials, and Telecommunications of the Technical Chamber of Greece, Member, 2004-2006.
- Director, Graduate Studies Program, Department of Industrial Engineering, University of Miami, Coral Gables, FL, 1999-2002.
- Invited Sessions Chair, INFORMS Miami, National Meeting, 2001
- IIE Greater Miami Chapter, Director, 1996-1998.
- Member of Planning Committee for the 1997 National Annual Meeting of the Institute of Industrial Engineers (IIE), Miami, FL, May 1997.
- Session Organizer for the Eighth Annual Conference of the Production and Operations Management Society (POMS), Miami, FL, Apr 1997.
- Reviewer of Proposals for Graduate Engineering Programs, European Union, Hellenic Department of Education, Athens, Greece, Jun 1997.
- *University Committee and Administrative Responsibilities:*
 - Energy Institute Leadership Committee, Texas A&M Energy Institute, Fall 2021-Present.
 - Executive Committee of the Interdisciplinary Curricular Program in Energy, Texas A&M Energy Institute, Fall 2021-Present.
 - Operations Committee, Texas A&M Energy Institute, Fall 2021-Present.
 - Management Committee, Texas A&M Energy Institute, Fall 2021-Present.
 - Executive Committee, Texas A&M Emergency Management Advisory Group (TEMAG), Jun 2020-Present.
 - Supply Chain Management Technical Lead for the *SecureAmerica* Institute; Technical Committee; Operations Committee; Proposals Evaluations Committee; Roadmap Committee; Jun 2020-Present.
 - Subject Matter Technical Expert; *SecureAmerica* Institute, Dec 2020-Present.
 - Lead, Doctor of Philosophy in Interdisciplinary Engineering (with a Supply Chain Management Focus), Department of Multidisciplinary Engineering, 2017-Present.
 - Member, ETID Standing Search and Hiring Committee, Feb 2021-Dec 2022.
 - Member, ETID Endowed Chair and Professorship Committee, Fall 2020-Present.
 - Member, ETID Tenure and Promotion Committee, Jan 2021-Dec 2022.
 - Member, MMET Search and Hiring Committee, Fall 2022-Present.
 - Member ETID Post Tenure Review Committee, 2022-2023.

- Member, IDIS Mentoring Committee for Dr. Y. Chang, Fall 2017- Spring 2024.
 - Member, IDIS Mentoring Committee for Dr. M. Kebliis, Fall 2017-Fall 2019.
 - Chair, IDIS Mentoring Committee for Dr. Na Zou, Fall 2020-Fall 2023.
 - Chair, IDIS Mentoring Committee for Dr. Chukwuzubelu Ufodike, 2024-Present.
 - Chair, IDIS Mentoring Committee for Dr. Elnaz Kabir, 2024-Present.
 - Chair, Faculty Search Committee, ETID, Aug 2017-May 2018.
 - Chair, Honours & Awards Committee, ETID, Aug 2018-Aug 2019.
 - Honours & Awards Committee, ETID; Member, October 2017-August 2018.
 - Post-Tenure Review (PTR) Committee, ETID; Member, Jan 2016- Dec 2018.
 - TEES Advisory Board, Advanced Manufacturing Committee; Head, 2016-2017.
 - Faculty Senate Member, Aristotle University of Thessaloniki, Greece, Aug 2014-Aug 2015.
 - Engineering College Council, Aristotle University of Thessaloniki, Greece, Aug 2013-Aug 2015.
 - Committee of Students' Transfers, Department of Mechanical Engineering, Aristotle University of Thessaloniki, Greece, 2004-2011.
 - Committee of Funding for Student Support, Aristotle University of Thessaloniki, 2004-2007.
 - Member of the Board of Directors, The Aristotle University of Thessaloniki Asset Management and Development S.A., Greece, 2003-2007.
 - Committee of Strategic Planning, School of Mechanical Engineering, Aristotle University of Thessaloniki, Greece, 2003-2007.
- Honors and Awards:
- Hellenic Society of Engineers Fellowship, 1983, 1984, 1985, 1986, 1987.
 - School of Operations Research and Industrial Engineering (S.O.R.I.E.) Teaching Assistantship Fellowship, Cornell University, 1987-1990.
 - IBM Research Fellowship, May 1990-December 1990.
 - Graduate School Teaching Award Fellowship, Cornell University, Jan 1991-Aug 1991.
 - University of Miami General Research Support Award, 1992, 1993.
 - University of Miami Max Orovitz Summer Award, 1993, 1995.
 - National Representative, Program Committee of 6th and 7th Framework Program, Thematic Priority: Sustainable Development, Global Change & Ecosystems /Sustainable Transportation, General Secretariat for Research & Technology, Oct 2004-2005.
 - Member; Advisory Committee of the EUREKA Pan-European Innovation Network; European Commission, Brussels, 2005-2010.
 - Honorary Board Member, Greek International Business Association (SEVE), 2014-Present.
 - TEES Research Professorship, Sep 2015; Reappointed Sept 2018-Aug 2020.
 - Graduate Faculty at Texas A&M University, Member, Jan 2016.

- Awarded Tenure on Arrival, Texas A&M University, Feb 12, 2016.
 - Research Fellow; Mosbacher Institute for Trade, Economics and Public Policy, Bush School of Government & Public Service, Texas A&M University; Aug 2020-Present.
 - Awarded Harvey Hubbell Professorship, Industrial Distribution Program, ETID, Sept 2020.
 - Advisory Council Member, *Harvard Business Review*, Mar 2022-Present.
 - Engineering Genesis Award Recipient, TEES, Apr 4, 2023 (for the \$5M RADAR funded grant).
- Other Professional Activities:
- *Conferences, Workshops and Events:*
 - Session Chair, Third International Conference on Management of Technology, Miami, FL, Feb 17-21, 1992.
 - Session Chair, Fourth International Conference on Productivity and Quality Research, 1993.
 - Session Chair, Fourth International Conference on Management of Technology, Miami, FL, Feb 27-Mar 4, 1994.
 - Session Chair, Fifth International Conference on Management of Technology, Miami, FL, 1995.
 - Session Chair, Sixth International Conference on Management of Technology, Miami, FL, 1996.
 - Session Chair, Institute for Operations Research and the Management Sciences (INFORMS), Washington D.C., May 5-8, 1996.
 - Session Chair, Institute for Operations Research and the Management Sciences (INFORMS), Atlanta, Nov 3-6, 1996.
 - Session Chair, 5th International Conference of the Decision Sciences Institute (DSI), Athens, Greece, Jul 4-7, 1999.
 - Scientific Committee, 8th Panhellenic Logistics Conference 2004, “The Day After”, Athens, Nov 26-27.
 - Organizing Committee and Co-Chairperson, 3rd International Workshop on Supply Chain Management & Information Systems (SCMIS), Thessaloniki, Jul 6-8, 2005.
 - Scientific Committee, 2nd International Conference on Manufacturing Engineering (ICMEN), Halkidiki – Greece, Oct 5-7, 2005.
 - **Chairman of Organizing Committee**, 9th Panhellenic Logistics Conference 2005, Thessaloniki, Nov 25-26, 2005.
 - Organizing Committee, Innovation and Entrepreneurship Conference, Centre for Research and Technology Hellas and Great Britain Embassy, Thessaloniki, Mar 9-10, 2006.
 - Organizing Committee and Co-Chairperson, 4th International Workshop on Supply Chain Management & Information Systems (SCMIS), Taiwan, Jul 5-7, 2006.
 - Scientific Committee, 19th National Conference of the Hellenic Operational Research Society (HELORS), Arta, Greece, Jun 21-23, 2007.

- Scientific Committee, First International Conference on Environmental Management, Engineering, Planning and Economics (CEMEPE), Skiathos Island, Greece, Jun 24-28, 2007.
- Organizing Committee, Global Innovation and Entrepreneurship Conference, Centre for Research and Technology Hellas and U.S. Consul General, Thessaloniki, Apr 18, 2008.
- Member of Scientific Committee, 3rd International Conference on Manufacturing Engineering (ICMEN) and 7th Coatings Conference, Halkidiki, Greece, Oct 1-3, 2008.
- Session Chair Organizer (“Sustainable Logistics and Supply Chain Management”), and Member of Scientific Committee, BalkanTrib 2008 Conference, Sozopol Bulgaria, Jun 12-14, 2008.
- **Chairman of Organizing Committee**, 12th Pan-Hellenic Logistics Conference, Thessaloniki, Nov 21-22, 2008.
- **Chairman of the Organizing Committee**, Kick-off Global Conference for the Development of the Innovation Zone of Thessaloniki; Ceremony of MOU Signage amongst all the innovative entrepreneurial stakeholders in Northern Greece, CERTH, Thessaloniki, Greece, Sep 8, 2010.
- **Co-organizer**, the 1st Olympus International Conference on Supply Chains, Oct 1–2, 2010.
- **Chairman of Organizing Committee**, 15th Pan-Hellenic Logistics Conference and 1st Southeast European Congress on Supply Chain Management, Thessaloniki, Nov 11-12, 2011.
- Member of Scientific Committee, ODYSSEUS 2012, 5th International Workshop on Freight Transportation and Logistics, Mykonos, Greece, May 21-25, 2012.
- Member of Scientific Committee, 2nd International Conference on Supply Chains (ISCS) - Olympus 2012, Oct 5-6, 2012, Co-organized by the Greek Association of Supply Chain Management, Alexander Technological Institute of Thessaloniki – Logistics Department, Laboratory of Quantitative Analysis, Logistics and Supply Chain Management, Department of Mechanical Engineering, Aristotle University of Thessaloniki.
- Session Organizer and Lead, Conference of the Greek International Business Association (SEVE), “Export Summit, Roadmap to Growth”, Hyatt Regency Hotel, May 3-4 2012, Thessaloniki.
- **Organizer and Chairman**, Workshop and Visit of the World Bank’s Logistics Performance Index Group at the Port of Thessaloniki, Jan 21, 2013.
- **Organizer and Chairman**, External Assessment of the School of Mechanical Engineering, Thessaloniki, Dec 16-18, 2013.
- **Organizer and Moderator**, Event for the Joint Collaboration of the Colleges of Engineering of Texas A&M and of the Aristotle University of Thessaloniki; Signage of MOU, Jul 10, 2014.
- **Session Organizer and Lead**, Conference of the Greek International Business Association (SEVE), “EXPORT SUMMIT II and the 39th IATTO Forum”, Makedonia Palace Hotel, Sep 25-27, 2014, Thessaloniki.
- **Scientific Committee Member**, 5th International Conference on Manufacturing Engineering (ICMEN), and 11th Coatings Conference, Halkidiki, Greece, Oct 1-3, 2014; Chairman of Session, “Design, CIM, Robots, Planning, Assembly, Measurements, Logistics (MAS)”.
- **Chairman of Organizing Committee**, 18th Pan-Hellenic Logistics Conference, Greek Association of Supply Chain Management, Thessaloniki, Nov 18-19, 2014.

- **Chairman of Organizing Committee**, 1st International Conference on Agrifood Supply Chain Management & Green Logistics, Halkidiki, Greece, May 27-30, 2015.
- **Organizer**: 2nd Capability Workshop for Texas Advanced Manufacturing. College Station (including representatives of All Texas Universities), TX, Feb 9, 2016.
- **Co-organizer**: TEES' NNMI Institute Proposal Planning Session with Agency of Trillions (AoT), College Station, May 18, 2016.
- **Organizing Committee Member**: Lead & Session Moderator on Manufacturing; 2016 TEES Annual Research Conference, College Station, TX, Jun 7, 2016.
- **Co-organizer**: "Sustainable Cultural Management International Intensive Summer Course", Thessaloniki, Greece, Jun 6-10, 2016.
- **Co-organizer**: Workshop for Texas Advanced Manufacturing Cyber-Physical Systems, College Station, TX, Jul 21, 2016.
- **Organizing Committee**: Cybersecurity of Critical Infrastructure Summit 2017, College Station, TX, Jan 11-13, 2017.
- **Organizer**: Workshop on Safety and Security for Food Supply Chains. With leading experts from the University of Illinois at Urbana-Champaign (UIUC), Worcester Polytechnic Institute (WPI) and TAMU from Engineering, Agriculture and Food Science disciplines. Texas A&M University, Memorial Student Center, Mar 13, 2017, College Station, TX.
- **Organizing Committee Member**: Lead & Session Moderator on Manufacturing; 2017 TEES Annual Research Conference, Prairie View A&M University, TX, May 31-Jun 1, 2017.
- **Session Organizer and Chair**: "Border Security, Risk Management and Resilience for Global Supply Chains", Institute for Operations Research and the Management Sciences (INFORMS), Houston, TX, Oct 22-25, 2017.
- **Scientific Committee Member**: Green Supply Chain (GSC' 2018) International Conference, Jul 2-4, 2018, Thessaloniki, Greece.
- **Chairman of Scientific Committee**: 4th International Conference on Supply Chains, Katerini, Greece, Sept 15-16, 2018.
- **Chairman of Scientific Committee**: Agribusiness Forum 2018-The Future of Greek & European Agriculture in the Digital Era, Serres, Greece; Nov 1-3, 2018.
- **Co-organizer**: 3rd Advanced Manufacturing Workshop, College Station, TX, Oct 24-25, 2018 (participants included highest level leaders from DOD, DOE and NIST, among others).
- **Organizer**: Workshop on Safety and Resilience for Global Food Supply Chains. With leading experts from the University of Illinois at Urbana-Champaign (UIUC), Worcester Polytechnic Institute (WPI) and TAMU from Engineering, Agriculture and Food Science disciplines; TEES, Dec 14, 2018, College Station, TX.
- **Co-organizer and Instructor**: Summer School in "Digital Supply Chain and Logistics Management", Jul 1-5, 2019, Thessaloniki, Greece (Texas A&M Engineering Experiment Station, Aristotle University of Thessaloniki, Hellenic Institute of Transport).

- **Organizer:** “Supply Chain Designs and Strategies for the Future”, Dr. Chelsea C. White III (Georgia Tech), Texas A&M Energy Institute Lecture Series, Sep 7, 2022.
- **Organizer:** “The Sustainable Supply Chain Costs, Compliance and Competitiveness: A Business Perspective”, Dr. Chris Gopal (Defense Business Board of the DOD and UC San Diego), Texas A&M Energy Institute Lecture Series, Jan 18, 2023.
- **Organizer:** “The Footprint of E-commerce and the Distribution Network of Amazon”, Hagler Institute for Advanced Study Invited Lecture, Prof. Jean-Paul Rodrigue (Distinguished Fellow), co-sponsored by the Mosbacher Institute for Trade, Economics, and Public Policy and the Texas A&M Energy Institute, Jan 23, 2023, College Station, TX.
- **Organizer:** “Efficient and Effective Large-Scale Vaccine Distribution”, Prof. John A. Muckstadt, Cornell University, Jan 17, 2024, College Station, TX. Co-sponsored by: the USA Center for Rural Public Health Preparedness, Texas A&M Health; the Scowcroft Institute of International Affairs, Bush School of Government and Public Service; and the Texas A&M Energy Institute.
- **Organizer:** “Towards Resilient-by-Design NextG Power Systems: Embracing Uncertainty and Leveraging Complexity”, Dr. Eman Hammad (Engineering Technology & Industrial Distribution), Texas A&M Energy Institute Invited Lecture, Apr 17, 2024.
- **Organizer:** “Towards Zero-Carbon Power Grids: Navigating Renewables’ Complexities and Constraints”, Dr. Elnaz Kabir (Engineering Technology & Industrial Distribution), Texas A&M Energy Institute Invited Lecture, Apr 24, 2024.
- *Invited and Keynote Speaker:*
 - Applied Operations Research Seminar, School of Operations Research and Industrial Engineering/Johnson Graduate School of Management, Cornell University, Jun 1992.
 - Third Annual Industrial Engineering Research Conference (IERC), Philadelphia, May 1994.
 - Distinguished Faculty Lecturer Series, Institute of Retired Professionals, University of Miami, Mar 1994.
 - EUROXV-INFORMS XXXIV, Session on “Reliability and Maintenance in Production Control”, Barcelona, Spain, Jul 14-17, 1997.
 - INFORMS/CORS, Session on “Maritime Logistics”, Montreal, Apr 26-29, 1998.
 - INFORMS, Session on “Industrial Applications of Integer Programming”, Philadelphia, Fall 1999.
 - Marine Transportation System (MTS) Research and Development Coordination Conference, Session on “Identifying Risks and Setting Priorities”, Washington, D.C., Nov 2-4, 1999.
 - **Invited Speaker:** “Supply Chain Management and World Trade, The Americas after 2005”. Symposium organized by the City of Coral Gables and the Florida Free Trade of the Americas, Feb 2004.
 - **Keynote Speaker:** “Logistics 2004-Procurement and Transportation Networks among EU and the Countries of the Southeastern Europe-Prospects of Development for Northern Greece”, Mar 20, 2004. Meeting/Gala, “Transport & Logistics”, a Joint Venture of HELEXPO-TECHNOEKDOTIKI SA & The International Society of Logistics - District of Thessaloniki, Mar 19-22, 2004, HELEXPO, Thessaloniki, Greece.

- **Invited Speaker:** “Risk Management in Supply Chains”, at the conference titled “Business Informatics & Computer Systems: Technology-Information Management-Applications”; Organized by the University of Macedonia, Thessaloniki, Greece, Dec 10-11, 2004.
- **Keynote Speaker:** “Supply Chain Management: Why should it of concern to the Chief Financial Officer”, Money Show, Thessaloniki, Greece, Dec 18-19, 2004.
- **Invited Speaker;** “The Role of Adoption of New Technologies in National Economy’s Competitiveness”, Annual Student Conference of University of Macedonia, Greece, Mar 22, 2005.
- **Invited Keynote Speaker:** “Contemporary Trends and Crisis Management under the Use of Technological Systems”, SAP Business Forum, Opera House, Athens, Greece, Apr 5, 2005.
- **Keynote Speaker:** “Logistics and Supply Chain Management: Education – Gaps – Challenges”, Technological Educational Institute of Thessaloniki, Katerini Chapter, Department of Logistics, Katerini, Greece, Jun 12, 2005.
- **Keynote Speaker:** “International Trade and Supply Chains”, 9th Panhellenic Logistics Conference, Thessaloniki, Greece, Nov 25-26, 2005.
- **Keynote Speaker:** “Value Innovation: A Strategic Roadmap for High Growth”, Conference on Innovation and Entrepreneurship, The Centre for Research and Technology Hellas (CERTH), Thessaloniki, Greece, Mar 9-10, 2006.
- **Keynote Speaker:** “Logistics 2006 – Intermodal Transport Networks and Port Hubs in South-East Europe”, a Joint Venture of HELEXPO-TECHNOEKDOTIKI SA & The International Society of Logistics, Thessaloniki, Greece, 20 May 2006.
- **Keynote Speaker:** “Trade Development through Supply Chain & Logistics Management”, Conference on Sustainable Development and Business in Modern European Cities, Thessaloniki Chamber of Commerce and Industry, Thessaloniki, Greece, Jun 11-12, 2007.
- **Invited Keynote Speaker:** “Global Trends and Challenges: The Impacts on Logistics and Supply Chain Management Research”, 6th Doctoral Workshop, Invited Speaker and Moderator; European (ELA) and German (BVL) Logistics Associations’ Conference, Berlin, Germany, Oct 16, 2007.
- **Invited Speaker:** “Supply Chain & Logistics Management and Trade Facilitation”, 30th SECI (South Eastern European Cooperative Initiative), Thessaloniki Chamber of Commerce and Industry, Thessaloniki, Greece, Dec 5, 2007.
- **Invited Speaker:** “Entrepreneurship, Innovation and Supply Chain Management”, Development Conference, Professional Commerce of Thessaloniki, Thessaloniki, Greece, Sep 3-4, 2009.
- **Moderator and Keynote Speaker:** “Financial Crisis and Challenges for Global Supply Chain”, International Logistics Forum 2009, Metropolitan Expo, Athens, Greece, Nov 7, 2009.
- **Invited Speaker:** “Innovation and Entrepreneurship in Global Environment”, Center Space, Technology and Gender, Engineering School, A.U.Th., Thessaloniki, Greece, Nov 19, 2009.
- **Keynote Speaker:** “Thessaloniki find its Identity”, Co-organization of Newspapers MAKEDONIA and THESSALONKI with the support of Engineering School, A.U.Th., Hyatt Regency, Thessaloniki, Greece, Feb 20, 2010.
- **Invited Speaker:** “Innovation, Entrepreneurship and University”, Center Space, Technology and Gender, Engineering School, A.U.Th., Thessaloniki, Greece, Mar 3, 2010.
- **Invited Speaker and Technical Expert:** “Workshop on Port Infrastructure & Logistics”; Hellenic and ab Dhabi Business Forum, Athens, Greece, Mar 18, 2010.

- **Invited Speaker:** “Logistics & Real Estate”, 1st Real Estate Conference of Thessaloniki, Kassandra, Chalkidiki, Greece, Apr 30-May 2, 2010.
- **Keynote Speaker:** “Innovation and Entrepreneurship in Today’s Global Environment”, 1st Innovation Festival of Thessaloniki, Co-organization of Helexpo and The Federation of Industries of Northern Greece (FING), Thessaloniki, Greece, May 14, 2010.
- **Invited Speaker:** Thessaloniki Business Conference; Boussias Communications, under the auspices of The Federation of Industries of Northern Greece (FING). Thessaloniki, Greece, Jun 10, 2010.
- **Keynote Speaker:** “Sustainable Supply Chain Management: A Comprehensive Optimization Framework”, 7th International Conference on Logistics & Sustainable Transport, University of Maribor, Slovenia, Jun 24 – 26, 2010.
- **Invited Speaker:** “Sustainable Development, Innovative and Green Entrepreneurship in Northern Greece”; Roundtable titled “Opportunities for Economic Growth in Northern Greece”, International Trade Fair, Thessaloniki, Greece, Sep 13, 2010.
- **Keynote Speaker:** “Innovation and Supply Chain Management in Today’s Globalized Landscape”, 1st Olympus International Conference on Supply Chains, Katerini, Greece, Oct 1-2, 2010.
- **Keynote Speaker:** “Innovation in Supply Chain Management in a Flattened World”, Anatolia American College of Thessaloniki (ACT), Oct 9, 2010, Thessaloniki, Greece.
- **Invited Speaker:** “The infrastructure and the policy-making tools offered by the Innovation Zone of Thessaloniki”, International Trade Fair, Thessaloniki, Greece, Nov 13, 2010.
- **Invited Speaker:** “Opportunities for Start-ups offered by the Innovation Zone of Thessaloniki, Institute of Young Entrepreneurs, Athens, Greece, Nov 18, 2010.
- **Keynote Speaker:** “How Sustainability is Redefining the Innovation Landscape”; “Black Sea Business Forum: The new era of green entrepreneurship”, Grand Palace Hotel, Thessaloniki, Nov 26, 2010.
- **Invited Speaker:** “Introduction to the Contemporary Entrepreneurial Environment” & “Challenges in Logistics & Supply Chain Management”, Graduate Program “Planning, Organization and Management of Transport Systems”, School of Civil Engineering, Aristotle University of Thessaloniki, Thessaloniki, Jan 17, 2011.
- **Keynote Speaker:** “Innovation, Supply Chain Management and ICT”, Computer Society of Northern Greece, Thessaloniki, Feb 25, 2011.
- **Keynote Speaker:** “Vision, Strategy and Execution for the Innovation Zone S.A.”, Innovation Forum of Thessaloniki, Thessaloniki, Mar 17, 2011.
- **Keynote Speaker:** “Strategy and Business Plan for the Alexandrian Innovation Zone S.A.”, Greek International Business Association, Thessaloniki, Mar 23, 2011.
- **Invited Speaker:** “The role of an Engineer/Manager in today’s Global Business Environment”; Association of Mechanical and Chemical Engineering Students, Aristotle University of Thessaloniki, Apr 5, 2011.
- **Keynote Speaker:** “Innovation and Supply Chain Management of Agrifood Products: A pillar of growth for the Alexandrian Innovation Zone S.A.”, National Agricultural Research Foundation (NAGREF), Thessaloniki, May 6, 2011.

- **Invited Speaker:** “A New Paradigm for Innovation Entrepreneurship and Global Supply Management”, International Hellenic University, Thessaloniki, Sep 9, 2011.
- **Keynote Speaker:** “Development of the Innovation Zone of Thessaloniki; the Role of the University in Promoting Innovation”, NOESIS Center, Thessaloniki, Sep 9, 2011.
- **Keynote Speaker:** “A Methodological Framework for Designing Sustainable Global Supply Chain Networks”, 4th International Conference on Manufacturing Engineering (ICMEN), Thessaloniki, Greece, Oct 3-5, 2011.
- **Keynote Speaker:** “Innovation and Supply Chain Management: A Catalyst for Entrepreneurial Development”, 4th European Conference on ICT for Transport Logistics (ECITL '11), Thessaloniki, Greece, Oct 13-14, 2011.
- **Invited Speaker:** “Design of Sustainable Global Supply Chain Networks”, Tempus Research Stakeholder Workshop, Thessaloniki, Greece, Nov 3, 2011.
- **Invited Speaker:** “Strategic Development of the Innovation Zone of Thessaloniki”, 1st Multi-conference on Innovation and Growth, Thessaloniki, Greece, Nov 5, 2011.
- **Invited Speaker:** “A New Paradigm for Innovation Entrepreneurship and Global Supply Management”, Entrepreneurship Workshop, University of Macedonia, Thessaloniki, Nov 8, 2011.
- **Keynote Speaker:** “The Role of Logistics in Greece and Successful SCM Strategies for the Future”, 15th Panhellenic Logistics Conference & 1st Southeast European Congress on Supply Chain Management, Thessaloniki, Greece, Nov 11-12, 2011.
- **Invited Speaker:** “Innovation Zone of Thessaloniki: A pillar of Growth for the City of Thessaloniki”; co-organized by the Thessaloniki *Chamber of Commerce and Industry*, the *Greek-Italian Chamber of Thessaloniki*, and the *Greek International Business Association (SEVE)*, Money Show, Hotel Hyatt Regency, Thessaloniki, Greece, Nov 26, 2011.
- **Invited Speaker by the Greek Parliament:** “Alexander Innovation Zone S.A.: A Catalyst for Innovative Entrepreneurship”, presented to the *Permanent Committee of Research and Technology, Hellenic Parliament*, Athens, Greece, Jan 18, 2012.
- **Invited Speaker:** “Development of the Innovation Zone of Thessaloniki”, organized by the *Chamber of Youth Entrepreneurship*, Society of Macedonian Studies, Thessaloniki, Mar 3, 2012.
- **Invited Speaker:** “Hellenic Ports, Logistics Networks and Development”; organized by the *Hellenic Institute of Transport / Centre for Research and Technology Hellas (CERTH)*, Thessaloniki, Greece, Mar 30, 2012.
- **Keynote Speaker:** “Internationalized Supply Networks and Exports”; Conference of the *Greek International Business Association (SEVE)*, “Export Summit, Roadmap to Growth”, Hyatt Regency Hotel, Thessaloniki, Greece, May 3-4, 2012.
- **Invited Panelist:** “The diffusion of Creativity and Innovation in Education and in Business”, National Book Fair, Thessaloniki International Trade Fair, Thessaloniki, Greece, May 26, 2012.
- **Invited Keynote Speaker:** 2nd International Conference on Supply Chains (ISCS) - Olympus 2012, Co-organization of Greek Association of Supply Chain Management, *Alexander Technological Institute of Thessaloniki – Logistics Department*, Laboratory of Quantitative Analysis, Logistics and Supply Chain Management, Department of Mechanical Engineering, AUTH, Thessaloniki, Greece, Oct 5-6, 2012.

- **Keynote Speaker:** “Thessaloniki Innovation Zone: The Ecosystem of Innovative Entrepreneurship”, Workshop “Securing Growth in times of Recession”, International Hellenic University, Thessaloniki, Greece, Nov 29, 2012.
- **Keynote Speaker:** “Ports and Globalized Supply Chain Networks: Opportunities for the Greek Ports”; ADRIAMOS Meeting, Angelika Pallas Hotel, Igoumenitsa, Greece, Dec 10, 2012.
- **Invited Keynote Speaker:** “Drafting a Successful bottom-up STP Strategy: The Case of Thessaloniki Innovation Zone”, *University of Split*, Croatia, Workshop, Dec 17, 2012.
- **Invited Keynote Speaker:** “STPs and Innovation Zones: Global Best Practices & Lessons Learned”, Workshop, *University of Split*, Croatia, Dec 17, 2012.
- **Invited Keynote Speaker:** “Import and Export of Skills and Talents”, “Education and Innovation in the 21st Century: Opening Frontiers for the Business Market”, organized by *The Economist Conferences*, Athens Concert Hall, Greece, Feb 28, 2013.
- **Invited Distinguished Professorship Lecture:** “Global Supply Chain Networks: The Value of Information & Supply Chain Integration”, Logistics and Forwarding, *University of Antwerp*, Belgium, May 14, 2013.
- **Invited Distinguished Speaker:** “Sustainable Global Supply Chain Networks: An Optimization-based Methodological Framework”, Department of Transport and Regional Economics, *University of Antwerp*, Belgium, May 14, 2013.
- **Invited Speaker:** “Greek Ports, Logistics Networks & Development”, Workshop of LOSAMEDCHEM project, *Thessaloniki Chamber of Commerce and Industry*, Greece, May 20, 2013.
- **Invited Keynote Speaker,** “Education and Innovation in the 21st Century: Opening Frontiers for the Business Market”, organized by *the Economist*, Invited Speaker, Athens Concert Hall, Greece, Feb 28, 2013.
- **Keynote Speaker:** “Thessaloniki Innovation Zone: The Ecosystem of Innovative Entrepreneurship”, Meet GREECE V2.0, Olympion, Thessaloniki, Jun 13-14, 2013.
- **Keynote Speaker,** “Sustainable Supply Chains”, XXXV CIOSTA & CIGR V Conference, Billund, Denmark, Jul 3-5, 2013.
- **Invited Speaker:** “International Supply Chains and Exports”, at “Exostrefia.gr”, organized by SAMARAS & ASSOCIATES S.A. and LEVER Development Consultants S.A., under the auspices of the *Greek International Business Association (SEVE)*, The Met Hotel, Thessaloniki, Greece, Sep 11, 2013.
- **Invited Speaker:** “Thessaloniki Innovation Zone: The Ecosystem of Innovative Entrepreneurship in Thessaloniki”, International Hellenic University, Thessaloniki, Greece, Sep 18, 2013.
- **Keynote Speaker:** “Sustainable Agricultural Production”, Scientific Coordinator, 1st Workshop of the GREEN-AgriChains: An FP7-REGPOT EU Funded Project, The MET Hotel, Thessaloniki, Greece, Sep 22-26, 2013.
- **Keynote Speaker:** “International Supply Chain Networks: Opportunities for Growth of Export Trade to Russia”. Workshop on “The catalytic role of transport in development of bilateral trade relations between Greece and Russia”, organized by *Greek-Russian Chamber*, Makedonia Palace Hotel, Thessaloniki, Greece, Sep 25, 2013.

- **Opening Keynote Address:** “Sustainable Mobility with Sustainable Technologies Development in Toyota – A Worldwide Effort and Network”; Workshop of School of Mechanical Engineering, Aristotle University of Thessaloniki, Greece, Sep 27, 2013.
- **Keynote Speaker:** “Globalized Supply Chain Networks in S.E. Europe: Opportunities for the Port of Thessaloniki”, *ADB Multiplatform Workshop*, Macedonia Pallas Hotel, Thessaloniki, Greece, Sep 27, 2013.
- **Keynote Speaker:** “Green Supply Chain Management”, LOGIC: 1st Logistics International Conference, Belgrade, Serbia, Nov 28-30, 2013.
- **Keynote Speaker:** “Feasibility Study: Establishing Dual Vocational Education and Training in the Transport and Logistics Sectors”, (with Thorsten Huelsmann, CEO of the EffizienzCluster, Fraunhofer System); Kick-off Meeting of Federal Institute for Vocational Education and Training (BIBB), *EffizienzCluster LogistiRuhr*, Bonn, Germany, Jan 14-16, 2014.
- **Keynote Speaker:** “Green Supply Chains in the Agrifood Sector”, Scientific Coordinator, 2nd Workshop of the GREEN-AgriChains: An FP7-REGPOT EU Funded Project, International Hellenic University, Thessaloniki, Greece, Jan 27-30, 2014.
- **Keynote Speaker:** “The Environmental Impact of Container Terminals’ Truck Operations Planning”, *CESAPO (Contribution of Emission Sources on the Air quality of the Port-cities in Greece and Italy)* International Workshop: “The impact of port and maritime activities on the air quality of the cities of Patras and Brindisi”; Thessaloniki, Greece, Jan 30, 2014.
- **Keynote Speaker:** “Dual System Practice and Opportunities for Greece: Logistics and Transportation Sectors”, *International Hellenic University*, Thessaloniki, Greece, Mar 14, 2014.
- **Opening Keynote Address:** “Road Transport, Logistics and Safety: ISO 39001:2012”, *Greek Association of Supply Chain Management*, Money Show 2014, Hyatt Regency Hotel, Thessaloniki, Greece, Mar 29, 2014.
- **Keynote Speaker:** “International Supply Chains and Exports”; Workshop on “The contribution of Customs and Logistics in the development of Greek exports”, organized by *Greek Federation of Enterprises and Industries and the Greek International Business Association (SEVE)*, Domotel Les Lazaristes, Thessaloniki, Apr 4, 2014.
- **Keynote Speaker:** “Maritime Transport and Logistics Chains - Opportunities for Greek Shipping”, Conference on “GREEK SHIPPING: Yesterday, Today & Tomorrow”, organised by the *Economia Group*, Port of Piraeus, Greece, Apr 7, 2014.
- **Keynote Speaker:** “Agrifood Supply Chains and Innovative Distribution Strategies”; Conference of *World Union of Wholesale Markets (WUWM)*, Thessaloniki, May 14-16, 2014.
- **Scientific Organizer and Lead:** “Corporate Social Responsibility Issues in the Agrifood Supply Chain”, 3rd Workshop of the GREEN-AgriChains: An FP7-REGPOT EU Funded Project, International Hellenic University, Thessaloniki, Greece, Jun 1-5, 2014.
- **Invited Speaker:** “Developing Dual Vocational Training Programmes for the Transport and Logistics Sectors in Greece”; Presentation Ceremony of Feasibility Studies, *Ministry of Education*, Athens, Greece, Jul 7, 2014.
- **Invited Speaker:** 10th Maintenance Forum, Roundtable on “Maintenance Profession: Qualifications, Workplace Rights & Obligations”, Athens, Greece, Oct 9-10, 2014.

- **Scientific Lead and Organizer:** “Sustainable Farming – Environmental Management”, 4th Workshop of the GREEN-AgriChains: An FP7-REGPOT EU Funded Project, The MET Hotel, Thessaloniki, Greece, Nov 16-18, 2014.
- **Keynote Speaker:** “Green Supply Chain Management: A Pan-European Centre of Excellence in Aristotle University of Thessaloniki”, 18th PanHellenic Logistics Conference, Thessaloniki, Greece, Nov 18-19, 2014.
- **Chairman and Moderator,** Roundtable on “The Role of Logistics as a Core Competence for the Development of Greece”; 18th Pan-Hellenic Logistics Conference, Thessaloniki, Nov 18-19, 2014.
- **Keynote Speaker:** “Growth Dynamics of the Municipality of Volvi and the Strategic Development of a Regional Network of Ports”, Technology & Human Resources Institute (I.A.T.A.P.), Drama, Greece, Dec 22, 2015.
- **Invited Speaker:** “Entrepreneurship, Supply Chain Management and the Unique Innovation Ecosystem in Thessaloniki”, Networking Event: “Entrepreneurship & Innovation”, Thessaloniki, Greece, Feb 27, 2015.
- **Keynote Speaker:** “Logistics and Supply Chain Management. Growth Drivers for the Global Economy”, MSc in Management Science and Information Systems, Department of Business Administration, Technological and Educational Institute of Eastern Macedonia & Thrace, Kavala, Greece, Mar 2015.
- **Keynote Speaker:** “Sustainable Maritime Transportation and Supply Chains. Growth Opportunities for the Greek Ports”; ECOCITY event: "Thessaloniki 2015, The Environmental Relationship between the Port and the City", Thessaloniki, Greece, Mar 19, 2015.
- **Keynote Speaker:** “Globalized Supply Chain Networks & Innovation: Opportunities for the Greek Economy”, Greek Economic Forum, Harvard University, Cambridge, MA, May 11-15, 2015.
- **Scientific Coordinator and Lead:** “Corporate Social Responsibility Issues in the Agrifood Supply Chain”; 5th Workshop of the GREEN-AgriChains: An FP7-REGPOT EU Funded Project, Porto Carras, Chalkidiki, Greece, May 27-30, 2015.
- **Keynote Speaker:** “Agrifood Supply Chain Management (SCM) and Green Logistics – GREEN-Agrichains: An FP7-REGPOT EU Funded Project”, GREEN-AgriChains Final Dissemination Event, Brussels, Belgium, Sep 18, 2015.
- **Invited Speaker:** “Sustainability and Risk Management: Challenges for Globalized Supply Chain Networks”, INFORMS Student Chapter, ETB Building, Texas A&M University, College Station, TX, Dec 4, 2015.
- **Invited Expert and Contributor:** Summit for the 2017 edition of the *U.S. Roadmap for Material Handling & Logistics: Version 2.0; The Story of Material Handling, Logistics and Supply Chain for the 2017-2030 Period*; Georgia Tech, Atlanta, GA, Aug 30, 2016.
- **Keynote Speaker:** “Globally Competitive Supply Chain Management”, Nutrabolt Corporation, College Station, TX, Feb 10, 2017.
- **Keynote Speaker:** “The Emerging Role of Ports within Globalized Supply Chain Networks”, German American Business Conference on “The Future of Ports”, organised by *The German American Chamber of Commerce of the Southern US, Inc.*, Houston, TX, Apr 4, 2017.
- **Invited Expert Contributor:** “Disrupting Illicit Supply Networks: New Applications of Operations Research & Data Analytics to End Human Trafficking”, **National Science Foundation** Workshop, Washington DC, Dec 1-2, 2017.

- **Invited Speaker and Organizing Committee Member:** “Impact of Additive Manufacturing on the Supply Chain and Logistics of the Future”, Supply Chain Readiness, TRX Technical Review & Exchange, *America Makes* Manufacturing USA Institute and EOS, Pflugerville, TX, Jun 20-21, 2018.
- **Speaker:** “Resilience and Competitiveness of Global Food Supply Chains”, Agribusiness Forum 2018-The Future of Greek & European Agriculture in the Digital Era; Nov 1-3, 2018, Serres, Greece.
- **Technical Speaker:** “Resilience and Security of Manufacturing Supply Chains”, *SecureAmerica* Institute, Coordination Meeting, Texas A&M University, Jun 10, 2020.
- **Speaker:** “Secure & Trusted Data-Driven Manufacturing Supply Chains for Competitiveness, Dynamic Resilience & Risk Mitigation”, *SecureAmerica* Institute, Founding Members Meeting, Texas A&M University, Aug 19, 2020.
- **Speaker/Panelist:** “Learning to Live with COVID-19: National Security and Global Supply Chains”, Dentons and the Scowcroft Institute of International Affairs, Bush School of Government and Public Service, Texas A&M University, Sept 23, 2020;
<https://www.youtube.com/watch?v=VARyDVD0MDc>
- **Invited Speaker:** “Food Safety Technologies for Resilient Farm-to-Fork Supply Chains: Lessons from a U.S.-Greece Collaboration”, 3rd Agribusiness Forum, Athens, Greece, Oct 7, 2020.
- **Invited Speaker:** “Intro to the Free Enterprise System”, Zachry Leadership Program, College of Engineering, Texas A&M, Mar 17, 2021.
- **Invited Speaker:** “Next Generation Supply Chain Resilience and Risk Mitigation”, *SecureAmerica* Institute, Winter Summit, Mar 31, 2021.
- **Speaker/Panelist:** “State-of-Play: Holistic View of the Current U.S. Manufacturing Ecosystem”, *SecureAmerica* Institute, Winter Summit, Apr 1, 2021.
- **Invited Keynote Speaker:** “A Conversation on Global Value Chains: China, COVID-19, and Resilience”, Mosbacher Institute for Trade, Economics and Public Policy, Bush School of Government and Public Service, Texas A&M University, Apr 7, 2021;
<https://www.youtube.com/watch?v=G5VuBovPpAM>
- **Invited Keynote Speaker:** “The Strategic Role of Supply Chains for National Security, Resilience and Competitiveness”; The Advanced Manufacturing Crisis Production Response (AMCPR): Crisis Response Challenge Workshop, *America Makes* Manufacturing USA Institute, *SecureAmerica* Institute and EOS, Jul 13, 2021.
- **Invited Keynote Speaker;** “Next-Generation Resilient Supply Chains”; 3rd Enterprise and Infrastructure Resilience Workshop, AIChE, Sept 27-29, 2021 (Virtual).
- **Invited Technical Expert:** “Reskilling/Upskilling Career DoD Civilians”, Department of Defense, Defense Business Board (DBB), Washington DC, Jan 20, 2022.
- **Distinguished Lecture Series Speaker:** “Next Generation Resilience and Sustainability of Energy and Manufacturing Supply Chain Networks”, Texas A&M Energy Institute, Feb 2, 2022.
- **Invited Speaker:** “Next-Generation Resilience and Sustainability of Manufacturing Supply Chain Networks”, Industrial Distribution Seminar Series, Texas A&M, Feb 18, 2022.
- **Invited Speaker and Panellist:** “Next-Generation Resilience for Bio-Industrial Supply Chains”; Session: Bio-Economy: Supply Chain Resilience and Workforce Needs, Oak Ridge Associated Universities (ORAU) Annal Meeting, Mar 7-8, 2022.

- **Invited Technical Expert:** “The Role of China in Global Supply Chains”, U.S.-China Economic and Security Review Commission, Washington DC, Apr 19, 2022.
- **Invited Expert:** “Expert Group Meeting on the Principles for Resilient Infrastructure”, United Nations Office for Disaster Risk Reduction (UNDRR), London, UK, Jul 19 & Dec 13, 2022. Efforts led FPR
- **Invited Keynote Speaker:** “Data-Driven Supply Chains for Next-Generation Cost-Competitive Resilience”, Gartner Research Board, Atlanta, GA, Nov 10, 2022.
- **Invited Speaker:** “Next-Generation Data-Driven Cost-Competitive and Sustainable Supply Chains: The Role of Strategic Sourcing”, MGT 449: Strategic Sourcing, Executive MBA Program, Rady School of Management, UC San Diego, Jan 21, 2023 (online).
- **Invited Keynote Speaker:** “Next-Generation Data-Driven Cost-Competitive Resilient & Sustainable Supply Chains”, Dow’s Data Day, Global Dow Center, Midland, Michigan, Aug 9, 2023.
- **Invited Keynote Speaker:** “Resilience and Sustainability of Integrated Energy & Manufacturing Supply Chains: The Path Forward, Opportunities and Relevant Initiatives”, Texas A&M Energy Institute, External Advisory Board Meeting, College Station, TX, Dec 8, 2023.
- **Invited Guest Speaker:** “Leadership and Next-Generations Supply Chains”, ENGR 421: Technology Company, Leadership, Management and Corporate Culture, Texas A&M Study Abroad Program, Thessaloniki, Greece, May 29, 2024.
- **Invited Keynote Speaker:** “The New Global Supply Chain Management Landscape: Directions for Research and Opportunities for Collaborations”, University of Western Macedonia, Grevena, Greece, May 31, 2024.
- *Leading Global and National Initiatives (since at Texas A&M):*
 - **Founding Advisory Committee;** Alliance for Logistics Innovation through Collaboration in the Americas (ALICIA). Jointly with Georgia Tech, Procter & Gamble, ES3, MHI, CHEP, UNC Charlotte and the Metro Atlanta Chamber.
Pre-launching event, MODEX, April 6, 2016, Georgia World Congress Center, Atlanta, GA.
 - Led the TEES’ participation in the “AGILE” consortium (with EWI), bidding for the National Network of Manufacturing Institutes’ “Robots in Manufacturing Environments Manufacturing Innovation Institute (RIME-MII)”, 2016 with a contribution of \$4M.
 - Assisted the Deputy Director of TEES for shaping the strategy and the execution plan for winning the leading nationally participation of TEES in six (6) *Manufacturing USA* Institutes; 2016-Present.
 - **Co-Director;** Texas A&M Cybersecurity Consortium for Advanced Manufacturing (C²AM): Cybersecurity & Risk Management for Manufacturing Supply Chains; Jan 2017- Dec 2019.
 - Developed and lead scientifically from TEES, the MOU signed among TEES, the Aristotle University of Thessaloniki, Greece, and the Hellenic Institute of Transport of the Centre for Research & Technology Hellas on **Supply Chain Management and Logistics**, Apr 2018-Present.
 - Led and developed a National Initiative on **Food Safety in the Global Supply Chain** (with the University of Illinois at Urbana-Champaign and Worcester Polytechnic Institute), Mar 2017- Dec. 2019 which was shortlisted for award (was selected as one of the 8 finalists out of 250+ proposals).
 - Submitted as the TAMU PI, an **NSF ERC Pre-Planning Proposal on “Food Safety Technologies for Resilient Supply Chains (FOSTeR)”**, Jan 11, 2019.

- On Apr 12, 2019, NSF invited us to submit a Full Proposal by Jul 12, 2019; On Aug 23, 2019 NSF informed us that FOSTeR was a finalist for award and NSF conducted a site visit at Worcester MA, Nov 4-5, 2019; Reverse Visit to NSF, Washington DC, was completed Dec 11-12, 2019.
- Led the Supply Chain thrust for the “**BioIndustrial Institute of Manufacturing Excellence (BIIOME)**” proposal, led by Battelle submitted to the Manufacturing USA Program; BIIOME was a finalist shortlisted for award; virtual site visit was conducted Aug 18, 2020 (due to Covid-19 constraints).
- Led the COE’s and TEES’ contribution to the proposal of Texas A&M System (TAMUS) for the **DHS S&T “Cross-Border Threat Security and Supply Chain Defense (CBTS)” Center of Excellence**; also, member of the Red Team of the Proposal. CBTS was awarded to TAMUS Oct 2018 for a 10 year-period with \$38M+.
- **Founder and TEES Scientific Lead**; for the MOU signed among TEES, the Aristotle University of Thessaloniki, Greece and the Hellenic Institute of Transport of the Centre for Research & Technology Hellas on Supply Chain Management and Logistics; Apr 2018-Present.
- **Supply Chain Management Scientific Lead**; MOUs of TAMUS with the Panama Canal Authority and the International Maritime University of Panama (UMPI) focused on Bio-Threats, a Logistics Observatory for Containerized Cargo and the Global Supply Chain.
- **Supply Chain Management Technical Lead**; *SecureAmerica* Institute proposal and national consortium that TEES led, in response to a FOA by DOE for the 15th Institute of the Manufacturing USA Program on *Cybersecurity in Energy Efficient Manufacturing*; Feb 2019-May 2020.

Teaching

■ Teaching Specialization:

Supply Chain Management, Logistics, Applied Operations Research, Production/Manufacturing Systems, Production and Inventory Control, Inventory Management, Project Management, Statistics and Probability, Stochastic Processes, Product Design, Manufacturing Analysis and Design, Computer Control in Manufacturing, Design of Integrated Manufacturing, Purchasing Applications in Distribution, Quality Process in Distribution; at both undergrad and graduate levels (both in Engineering and Business Schools), with a proven track-record of excellence in teaching.

- **University of Miami** – Undergraduate Subjects or Courses Taught/Developed:
 - **IEN 311:** Applied Statistics and Probability
 - **IEN 407:** Product Design
 - **IEN 465:** Production and Inventory Control
- **University of Miami** – Post-graduate Subjects or Courses Taught/Developed:
 - **IEN 502:** Manufacturing Analysis and Design II
 - **IEN 507:** Computer Control in Manufacturing
 - **IEN 645:** Stochastic Processes
 - **IEN 665:** Advanced Production Systems
 - **IEN 663:** Project Management Techniques
 - **IEN 664:** Supply Chain Management

- **MBA/MSIE 665:** Production Planning and Inventory Control
- **MBA/MSIE 565:** Design of Integrated Manufacturing Systems
- **IEN 617:** Quality Through Design
- **IEN 642:** Linear Programming and Extensions
- **IEN 641:** Supply Chain Management
- **University of Miami** – Courses Taught for Executive Off-Campus Programs:
 - **IEN 502 for:** United Space Alliance, Boeing, NASA
 - **IEN 565/IEN 665 for:** AT&T, McDonnell Douglas, Rockwell, Harris Corporation, Pratt & Whitney
 - **IEN 663 for:** IBM
 - **IEN 617** (Master of **Science** with a Concentration in Quality Management Program), at: Miami's Knight Center, Miami, FL, McDonald's Training Center, Orlando, FL, Jacksonville, FL.
 - **IEN 645 for:** Pratt & Whitney, NASA
 - **IEN 642 for:** Pratt & Whitney, NASA, Johnson & Johnson
 - **IEN 641 for:** Pratt & Whitney
 - **IEN 664 for:** Pratt & Whitney, United Space Alliance, Boeing, NASA, IBM.
- **Aristotle University of Thessaloniki** – Undergraduate Subjects or Courses Taught/Developed:
 - **SN 125:** Operations Research I (2002 – Aug 2015)
 - **SN 327:** Production and Inventory Control (2002 – Aug 2015)
 - **SN 365:** Supply Chain Management (2003 – Aug 2015)
 - **SN 364:** Simulation (2008 – Aug 2015)
- **Aristotle University of Thessaloniki** – Post-graduate Subjects or Courses Taught/Developed:
 - **SN 202:** Production and Inventory Control (2002 – 2003)
- **Business School, University of Macedonia, Thessaloniki, Greece** – Post-graduate Subjects or Courses Taught/Developed:
 - **MBA:** Operations Management/Supply Chain Management (2004 – 2012), Executive MBA Program
- **Business School, International Hellenic University** – Post-graduate Subjects or Courses Taught/Developed:
 - Supply Chain Management, School of Economics & Business Administration (2012-2014)
 - Operations Management, School of Economics & Business Administration (2012-2014), Executive MBA Program
 - Innovation & Entrepreneurship, Educational Program, Apr 2014.
 - Life Long Learning Program, “From Idea to Business”, Spring School, Mar 2015.
- **Hellenic Policy Academy** - Courses Taught/Developed:

- Strategy Development, Re-engineering and Change Management (2007-2015)
- **Texas A&M University, Department of Engineering Technology and Industrial Distribution**
 - **IDIS 343:** Distribution Logistics (Spring 2016).
 - **IDIS 424:** Purchasing Applications in Distribution (Spring 2017, Fall 2017, Spring 2018, Fall 2018, Fall 2020, Spring 2021, Fall 2021, Fall 2022, Spring 2023).
 - **IDIS 434:** Quality Process in Distribution (Fall 2019, Spring 2020, Fall 2021).
 - **ICBE 698:** Fundamentals of Supply Chain Management, Texas A&M Energy Institute; Developed new graduate level course (Fall 2023, Fall 2024).
- Educational Development:
Developed a new interdisciplinary Certificate in Resilient & Sustainable Energy & Manufacturing Supply Chains, Texas A&M Energy Institute.
- Dissertation Advisor:
 - *Ph.D. Dissertations Supervised (Chairman):*
 1. Dr. Lalit Yudhbir, “A Maritime Risk and Transportation Model for the Transport of Crude Oil and Petroleum Products”, University of Miami; defended Dec 1999.
 2. Dr. Julian Pachon, “Strategic and Tactical Yield management for Car Rental Companies”, University of Miami; defended Apr 2000.
 3. Dr. Edward Ron, “Pricing and Capacity Allocation in Multinational Firms with Product Substitution, Tax and Exchange Rate Externalities”, University of Miami; defended Dec 2004.
 4. Dr. Anastasios Xanthopoulos, “Optimization of Strategic Design, Production Planning and Operation of Reverse Supply Chains”, Aristotle University of Thessaloniki; defended Jan 2008.
 5. Dr. Dimitrios Aidonis, “Applications of Operations Research Techniques for the Optimal Design and Operations of Reverse Supply Chain Management for Construction Materials”, Aristotle University of Thessaloniki (AUTH); defended Jul 2009.
 6. Dr. Maria Chatzipanagioti, “The Effect of International Trade and Sustainability on the Strategic Design of International Supply Chains”, Aristotle University of Thessaloniki; defended Nov 2010.
 7. Dr. Agorasti Toka, “Decision-making models for the Design and Management of Supply Chains for the Energetic Utilization of Biomass”, Aristotle University of Thessaloniki; defended Jul 2013.
 8. Dr. Christos Keramydas, “Quantitative Methods in Supply Chain Management of Substitute Products and Services”, Aristotle University of Thessaloniki; defended Jul 2013.
 9. Dr. Naoum Tsolakis, “Planning and Management of Sustainable Supply Chains in the Agrifood Sector”, Aristotle University of Thessaloniki; defended Mar 2015.
 10. Dr. Eirini Aivazidou, “Decision-Making Systems for the Sustainable Management of Supply Chains”, Aristotle University of Thessaloniki; defended Oct 2017.
 11. Dr. Olga Yakavenka, “Strategic Design of Intermodal Transport Network for Sustainable Supply Chains of Perishable Goods”, Aristotle University of Thessaloniki; defended Mar 2020.
 12. Shivam Vedant, “Resilience and Sustainability of Integrated Energy and Manufacturing Supply Chain Networks”, (jointly with Dr. Stratos Pistikopoulos Texas A&M Energy Institute); Interdisciplinary Engineering Program. Started Jul 2021; in progress.

13. Catherine Nkoutche, “Sustainability of Energy Supply Chains” (tentative), (jointly with Dr. Stratos Pistikopoulos Texas A&M Energy Institute); Department of Chemical Engineering. Started Mar 2022; in progress.
14. Halil Iseri, Interdisciplinary Engineering Program. Started Jan 2024; in progress.

• *Ph.D. Dissertations Supervised (Member):*

1. Dr. James Koshy, “A Comprehensive Examination of Age Effects as Related to Workplace Accidents and Injuries at a Major Urban Health Care Facility”, U. of Miami; defended Feb 1996.
2. Dr. Peixing Sun, “Concurrency Control in Multi-Database Systems”, University of Miami; defended Feb 1996.
3. Dr. Hany Fahmy, “An Integrated AI Approach for Automating Network Design, Modeling and Simulation”, University of Miami; defended Dec 1996.
4. Dr. Emad Hassen Abo-EI-Ela, “Fuzzy Optimization Routing in ATM Networks”, University of Miami; defended 1999.
5. Dr. Zuji Mao, “Location Management Strategies for Personal Communications Services Networks”, University of Miami; defended 2000.
6. Dr. Gang Feng, “Neural Network and Algorithmic Methods for Solving Optimization Problems in Communication Networks”, University of Miami; defended 2001.
7. Dr. Ipatia Theodorakioglou, “Suppliers’ Relationship Management in Supply Chain Management and its Correlation with Intrafirm Quality Management”, Univ. of Macedonia; defended 2005.
8. Dr. George Nenes, “Comparative Study of Special Statistic and Dynamic Control Production Processes Charts”, Aristotle University of Thessaloniki; defended 2006.
9. Dr. Sofia Panagiotidou, “Joint Optimization Planning of Statistic Quality Control and Preventive Maintenance”, Aristotle University of Thessaloniki; defended 2006.
10. Dr. Aristidis Matopoulos, “Development of a Conceptual Framework for the Visibility of the Agricultural Product”, University of Macedonia; defended 2007.
11. Dr. Christos Zikopoulos, “Quantitative Analysis for Production and Distribution of Reverse Supply Chains”, Aristotle University of Thessaloniki; defended Jun 2007.
12. Dr. Paraskevi Kapetanopoulou, “Reverse Logistics in the Greek Industry”, AUTH; defended Jul 2009.
13. Dr. Dimitrios Tsitsamis, “Optimization of Port Container Terminals (for the Port Authority of Thessaloniki)”, University of Piraeus; defended Jul 2009.
14. Dr. Maria Besiou, “Optimization of Green Supply Chains”, AUTH; defended Jul 2009.
15. Dr. Ioannis Mallidis, “Optimization of Green Supply Chains”; AUTH; defended Jun 2013.
16. Dr. Nicolaos D. Goumagias, “A Markov-based Decision Support Model for Tax Evasion in Greece”, Department of Applied Informatics, University of Macedonia; defended Oct 2013.
17. Dr. Konstantinos Papanayiotou, “A Holistic Methodological Framework for Supply Chain Risk Management”, Aristotle University of Thessaloniki; defended 2014.
18. Dr. Alexandra Politou, “Short-term Production Planning and Control for Make-to-Order / flow-shop Manufacturing Systems”, Aristotle University of Thessaloniki; defended Jul 2015.

19. Dr. Alexandra Michailidou, “Methodological Framework to Holistically Assess the Environmental Impact from Interventions Aiming at Tourism Development”, AUTH; defended Apr 2017.
 20. Dr. Dimitrios Bechtsis, ““Digital manufacturing methodologies and information technology (IT) tools for the management and control of autonomous vehicles in Supply Chains”, AUTH; defended Mar 2018.
 21. Christos Papaleonidas, “Developing an Innovative Decision Support System for Modelling and Holistic Optimization of the LNG Supply Chain”, School of Naval Architecture and Marine Engineering, National Technical University of Athens, Greece. Started Jan 2017; in progress.
 22. Patricia Kio, “Industrial Symbiosis for Reuse by Architectural Design”, Texas A&M University, College of Architecture. Started Aug 2018; defended Oct 2021.
 23. Natasha J. Chrisandina, “Building Resilient Distributed Manufacturing Networks”, Texas A&M University, Department of Chemical Engineering. Started Jul 2021; in progress.
 24. Carlos Bertrand, “IMO 2050 Compliant New Ship Designs and the Impact to the Global Maritime Supply Chain”, Interdisciplinary Engineering Program. Started Nov 2021; in progress.
 25. Styliani Doumptiou, “Corruption in Environmental, Social, Governance (ESG) Reporting: A Quantitative Predictive Methodological Framework”, Department of Statistics and Social Sciences, University of Western Macedonia, Greece. Started Aug 2022; in progress.
 26. Moustafa Ali, “A Data-Driven Methodological Framework for Safety Management and Resilience in Industrial Intensified Process Systems”, Department of Chemical Engineering. Started in Feb 2023; defended May 2024.
 27. Sahithi Srijana Aknudi, “Integration of Safety with Control, Scheduling and Planning”, Chemical Engineering. Started July 2023; in progress.
 28. Funda Iseri, “Advanced Data Analytics and Optimization Models on Energy Systems, Supply Chains and Biotoxicology”, Department of Chemical Engineering. Started Aug 2023; in progress.
- *Post Doctorate Supervisor:*
 1. Dr. Huan Li, University of Miami, 1995-1996.
 2. Dr. Agorasti Toka, Aristotle University of Thessaloniki, 2014-Aug 2015.
 3. Dr. Ioannis Mallidis, Aristotle University of Thessaloniki, 2014-Aug 2015.
 4. Dr. Christos Keramydas, Aristotle University of Thessaloniki, 2014-Aug 2015.
 5. Dr. Charisios Achillas, Aristotle University of Thessaloniki, 2014-Aug 2015.
 6. Dr. Foivos Anastasiadis, Aristotle University of Thessaloniki, 2014-Aug 2015.
 7. Dr. Antonopoulos Ioannis-Sofoklis, Aristotle University of Thessaloniki, 2014-Aug 2015.
 8. Dr. Baniias Georgios, Aristotle University of Thessaloniki, 2014-Aug 2015.
 9. Dr. Fragkou Evangelia, Aristotle University of Thessaloniki, 2014-Aug 2015.
 10. Dr. Grougiou Vassiliki, Aristotle University of Thessaloniki, 2014-Aug 2015.
 11. Dr. Kalognomou Liana, Aristotle University of Thessaloniki, 2014-Aug 2015.
 12. Dr. Kontogianni Stamatia, Aristotle University of Thessaloniki, 2014-Aug 2015.
 13. Dr. Kougias Panagiotis, Aristotle University of Thessaloniki, 2014-Aug 2015.
 14. Dr. Malamakis Apostolis, Aristotle University of Thessaloniki, 2014-Aug 2015.

15. Dr. Manikas Ioannis, Aristotle University of Thessaloniki, 2014-Aug 2015.
16. Dr. Ntinis Georgios, Aristotle University of Thessaloniki, 2014-Aug 2015.
17. Dr. Tamvakidis Stelios, Aristotle University of Thessaloniki, 2014-Aug 2015.
18. Dr. Tseas Georgios, Aristotle University of Thessaloniki, 2014-Aug 2015.
19. Dr. Derun Zhang, Texas A&M Engineering Experiment Station, Aug 2019-Aug 2020.
20. Dr. Kai Huang, Texas A&M Engineering Experiment Station, Aug 2020-Jan 2022.
21. Dr. Jafaru Egieya, Texas A&M Energy Institute, Aug 2023-Present (jointly with. Prof. Pistikopoulos E.)